ALLEN PARK SUBDIVISION

SITE DATA

PROJECT: ALLEN PARK SUBDIVISION - PHASE 1

ENGINEER: TIMMONS GROUP

5410 TRINITY ROAD, SUITE 102 RALEIGH. NC 27607 PHONE: 919-866-4509 FAX: 919-859-5663

MIKE ZACCARDO, PE

NATELLI COMMUNITIES

EMAIL: MIKE.ZACCARDO@TIMMONS.COM

DEVELOPER

1903 N. HARRISON AVE CARY, NC 27513 PHONE: 919-868-3102 **BRIAN MASSENGILL** EMAIL: BRIAN@NATELLI.COM

PROPERTY LOCATION:

2300 OLD MILBURNIE ROAD WAKE COUNTY. NORTH CAROLINA

1745-43-7740, 1745-43-0006, 1745-54-5662, PORTION OF 1745-54-6015

GR-8 PUD (APPROVED ON 4/21/21) **EXISTING ZONING**

TOWNSHIP: ST. MATTHEW'S

SINGLE FAMILY RESIDENTIAL PROPOSED USE:

TOTAL PROPOSED UNITS: 138 TOTAL

> 81 SINGLE FAMILY + 57 ATTACHED TOWNHOMES

SETBACKS: FRONT LOAD DETACHED REAR LOAD DETACHED FRONT: 10'

> REAR: 20' DRIVEWAY LENGTH: 20' REAR: 20'

DRIVEWAY LENGTH: 20'

CORNER: 10' CORNER: 10'

REAR LOAD TOWNHOME FRONT: 10'

DRIVEWAY LENGTH: 20' REAR: 20'

BUILDING SEPARATION: 10' CORNER: 10'

DENSITY: PROPOSED DENSITY = 3.46 DU/A

CONNECTIVITY INDEX: NODES = 50

BOUNDARY TAKEN FROM SURVEY BY KCI ASSOCIATES,

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used

for this project shall conform to the standards and specifications of the City's Public

Utilities Handbook. City of Raleigh Public Utilities Department Permit #

for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection to its public sewer system and extension of the **private sewer collection** system as shown on this plan. The

material and constructions methods used for this project shall conform to the

standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit#

CONSTRUCTION DRAWING APPROVAL

REQUIRED FOR DEVELOPMENT

Know what's **below.**

Call before you dig.

DATED JANUARY 16, 2020, CERTIFIED BY JAMES M.

Water and Sewer Permits (If applicable)

SURVEY NOTE

GELLENTHIN, PLS

LINKS = 73 73 / 50 = 1.46

OPEN SPACE: OPEN SPACE AREA PROVIDED: 24.80 AC

ACTIVE OPEN SPACE AREA PROVIDED: 13.12 AC

TREE COVER AREA: DEVELOPMENT PERIMETER = 15,165 LF TREE COVER AREA = 15,165 LF * 20 LF = 303,280 SF

> NEUSE RIVER BUFFER AREA = 465,991 SF SHOD OVERLAY AREA = 137,319 SF

> > 12" X 12" Cross

12" Blow Off Assemblies

8" Blow Off Assemblies

6" Blow Off Assemblies

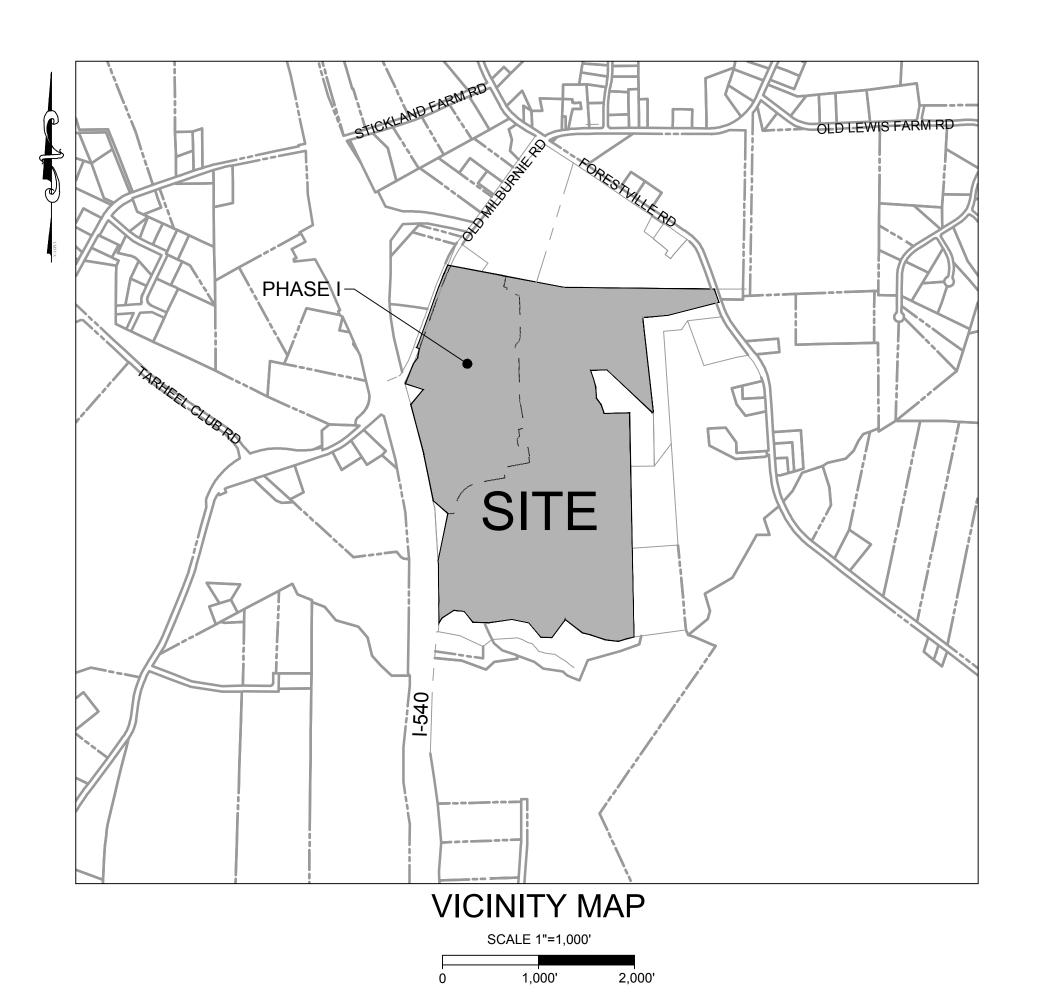
6" Water Reducers

8" X 8" Cross

TREE COVERAGE PROVIDED = 603,310 SF

CONSTRUCTION DOCUMENTS - PHASE 1 TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

ZMA-5-20



QUANTITIES TABLE - PHASE 1

5,369 L 13,056 L 22,667 L 36,850 L	_F	
13,056 L 22,667 L	_F	
22,667 L		
+	_F	
36.850		
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285		
136,800		
85,500		
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A contacting the Public Works Department at (919)		
	TON CON's ctor responsible proved in these p Torks Departn	

3 EA

4 EA 8 EA

0 EA 4 EA

1 EA

ACTORS the extension of water, , is responsible for t at **(919) 996-2409**, and 996-4540 at least

Failure to notify both **City Departments** in advance of beginning construction, will result in the issuance of *monetary fines*, and require reinstallation of any water or sewer facilities not inspected as a result of this notification failure.

Failure to call for Inspection, Install a Downstream Plug, have Permitted Plans on the Jobsite, or any other Violation of City of Raleigh Standards will result in a Fine and Possible Exclusion from future work in the City of Raleigh.

WILMAR II LLC, MARTIN ALLEN FAMILY LLC 2300 OLD MILBURNIE ROAD KNIGHTDALE, NC 27604 **EVERETT NICHOLS JR** 6208 BATTLEFORD DR RALEIGH, NC 27612 JOHN CHARLES DELLINGER 6030 FORESTVILLE RD

OWNERS OF RECORD

RALEIGH, NC 27604

EROSION AND SEDIMENT CONTROL APPROVED PLAN DATE PERMIT NO. S-Wake County Environmental Services Sedimentation & Erosion Control 919-856-7400 ENVIRONMENTAL CONSULTANT SIGNATURE

> inconsistency between these construction drawings and the Town of Knightdale's Approved Standards for this project, the Approved Standards shall control. Town of Knightdale Approved Standards shall mean all development documents necessary for approval for the Property including, but not limited to, any special use permit, subdivision plan, site plan, subdivision plat(s), phasing schedule, Development Agreement, Utility Allocation Agreement, Annexation Agreement, the Town of Knightdale Standard Specification and Details Manual and applicable provisions of the

Town Approved Standards Shall Control. In the event of a conflict or

Professional Design Engineer Certification. These improvements shall be constructed in accordance with the following drawings and with the Standard Specifications of the Town of Knightdale.

North Carolina State Building Code.

, PE, certify that the Standard Specifications of the Town of Knightdale have been thoroughly checked and found to be applicable to this project. All exceptions to the applicable Town standards have been previously approved by the Town of Knightdale and said exceptions are shown on Sheet(s) ______ of these drawings.

	Sileet List Table						
Sheet Number	Sheet Title						
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C0.1	PROJECT NOTES						
C1.0	OVERALL EXISTING CONDITIONS						
C1.1	EXISTING CONDITIONS - SHEET 1 OF 2						
C1.2	EXISTING CONDITIONS - SHEET 2 OF 2						
C2.0	OVERALL SITE PLAN						
C2.1	SITE PLAN - SHEET 1 OF 2						
C2.2	SITE PLAN - SHEET 2 OF 2						
C2.4	SIGNAGE AND MARKING PLAN - SHEET 1 OF 2						
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C3.0	OVERALL UTILITY PLAN						
C3.1	UTILITY PLAN - SHEET 1 OF 2						
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C4.0	OVERALL GRADING & DRAINAGE PLAN						
C4.1	GRADING & DRAINAGE PLAN - SHEET 1 OF 2						
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C4.2	STORM SEWER SCHEDULE						
C5.1	ROAD A PLAN & PROFILE						
C5.1	ROAD A PLAN & PROFILE ROAD C PLAN & PROFILE - SHEET 1 OF 2						
C5.2 C5.3	ROAD C PLAN & PROFILE - SHEET 1 OF 2 ROAD C PLAN & PROFILE - SHEET 2 OF 2						
C5.3	ROAD D PLAN & PROFILE						
C5.5	ROAD E PLAN & PROFILE						
C5.6	ROAD I PLAN & PROFILE						
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C5.8	ROAD N PLAN & PROFILE						
C5.9	ROAD W PLAN & PROFILE						
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C7.3	WATER & SEWER DETAILS - SHEET 1 OF 2						
C7.4	WATER & SEWER DETAILS - SHEET 2 OF 2						
C7.5	STORM DETAILS						
C9.0	OVERALL LANDSCAPING PLAN						
C9.1	LANDSCAPING PLAN - SHEET 1 OF 2						
C9.2	LANDSCAPING PLAN - SHEET 2 OF 2						
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Sheet List Table

PUBLIC INFRASTRUCTURE

Sewer		Concrete/Asphalt			
IASE 1		PHASE 1			
anholes	64	EA	Private Streets		LF
Public Sanitary Sewer	9,421	LF	Public Streets	13,056	LF
wer Services	285	EA	Public 5' Sidewalk	22,667	LF
Water			30" Curb & Gutter	36,850	LF
IASE 1			Site Data		
" Public Water main	1,646	LF	PHASE 1		
Public Water main	10,891	LF	Number of Lots	285	
Public Water main	1,179	LF	GPD Usage Water	136,800	
ater Services	232	EA	GPD Usage Sewer 85,500		
re Hydrant Assemblies	35	EA	Calculation for GPD Water (per Unit)		
" Gate Valves	21	EA	Calculation for GPD Sewer (per Unit)	300	
Gate Valves	53	EA	ACCOUNT	227 (202	
Gate Valves	34	EA	ATTENTIO		
" X 12" Tees	3	EA	The <i>Construction Contractor</i> responsible		
" X 8" Tees	4	EA	sewer, and/or reuse, as approved in these p		_
" X 6" Tees	3	EA			
X 8" Tees	13	EA	twenty four hours prior to beginning any of		
X 6" Tees	29	EA			
			Egiluva to notify both City	Danautusaut	. in

Natelli Communities

THOUGHTFUL PLANNING TIMELESS DESIGN ATTENTION TO DETAIL

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE
TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS
TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF
KNIGHTDALE.

DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT. DATE: _

12/23/2023 DRAWN BY 331

DESIGNED BY 331 CHECKED BY SCALE

N/A

44529

SHEET NO. C0.0

12/23/2021 DRAWN BY

> 331 DESIGNED BY CHECKED BY . ZACCARDO SCALE N/A

JOB NO. 44529

SHEET NO.

C0.1

GENERAL NOTES

BOUNDARY SURVEY TAKEN FROM KCI ASSOCIATES, DATED JANUARY 16, 2020, CERTIFIED BY JAMES. M GELLENTHIN, PLS.

TOPOGRAPHY IS TAKEN FROM WAKE COUNTY GIS.

THE CONTRACTOR SHALL CONTACT NC ONE CALL CENTER PRIOR TO ANY DIGGING

ALL PUBLIC WATER IMPROVEMENTS SHALL CONFORM TO ALL WAKE COUNTY PUBLIC UTILITIES DEPT. AND NCDENR DEH PWS STANDARDS AND SPECIFICATIONS. ALL SANITARY SEWER IMPROVEMENTS SHALL CONFORM TO ALL WAKE COUNTY PUBLIC UTILITIES DEPT. AND NCDENR DWQ STANDARDS AND SPECIFICATIONS.

THE CONTRACTOR SHALL CHECK PLANS AND FIELD CONDITIONS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BEFORE PERFORMING WORK IN THE AFFECTED AREA.

THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR.

IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXCAVATIONS AGAINST COLLAPSE AND SHALL PROVIDE BRACING, SHEETING OR SHORING AS NECESSARY. TRENCHES SHALL BE KEPT DRY WHILE PIPES ARE BEING PLACED, DEWATERING SHALL BE USED AS REQUIRED, AND PERMITTED THROUGH LOCAL GOVERNMENTAL AGENCIES AND WATER MANAGEMENT DISTRICT PER CURRENT REGULATIONS AT THE SOLE COST OF THE CONTRACTOR.

WORK BEING PERFORMED UNDER THIS CONTRACT SHALL INTERFACE SMOOTHLY WITH OTHER WORK BEING PERFORMED IN THE AREA BY OTHER CONTRACTORS AND UTILITY COMPANIES. IT WILL BE NECESSARY FOR THE CONTRACTOR TO COORDINATE AND SCHEDULE HIS ACTIVITIES, WHERE NECESSARY, WITH OTHER CONTRACTORS AND UTILITY COMPANIES.

PIPE SPECIFICATIONS

A) 12" AND 8" DUCTILE IRON PIPE SANITARY SEWER:

B) 8" SDR 35 PVC, 8" DUCTILE IRON PIPE

ZONING CONDITIONS

TOWNHOMES SHALL BE TWO-STORY HOMES WITH A MINIMUM WIDTH OF 22' WIDE AND HAVE A MINIMUM HEATED AREA OF 1,500 SQUARE FEET.

2. NEO TRADITIONAL SINGLE FAMILY DETACHED HOMES SHALL BE REAR LOADED TWO-STORY HOMES BUILT ON LOTS LESS THAN 60 FEET WIDE WITH A MINIMUM HEATED AREA OF 1,500 SQUARE FEET.

3. SINGLE FAMILY RANCH DETACHED HOMES SHALL BE BUILT ON LOTS TYPICALLY 60 FEET WIDE, BUT UP TO 20 HOMES MAY BE BUILT ON LOTS THAT ARE AT LEAST 55 FEET WIDE, WITH A MINIMUM HEATED AREA OF 1,480 SQUARE FEET, AND NO MORE THAN 25% OF THE RANCH HOMES MAY BE LESS THAN 1,500 SQUARE FEET.

4. TRADITIONAL SINGLE FAMILY DETACHED HOMES SHALL BE TWO-STORY HOMES BUILT ON LOTS AT LEAST 60 FEET WIDE WITH A MINIMUM HEATED AREA OF 2,100 SQUARE FEET. NO MORE THAN 10% OF THE TRADITIONAL SINGLE FAMILY DETACHED HOMES MAY BE HOMES LESS THAN 35' WIDE.

ALL HOMES WILL EITHER CONSIST OF A SINGLE MATERIAL OF BRICK OR STONE OR WILL HAVE A COMBINATION OF 2 OR MORE OF THE FOLLOWING MATERIALS ON THE FRONT FACADE (NOT INCLUDING FOUNDATIONS): STONE, BRICK, LAP SIDING, FIBER CEMENT SIDING, SHAKES, OR BOARD AND BATTEN SIDING, WITH SIDE AND REAR FACADES OF FIBER CEMENT SIDING. WHEN 2 MATERIALS ARE USED, THE MATERIALS SHALL BE DIFFERENT BUT COMPLIMENTARY COLORS. VINYL MAY ONLY BE USED OF SOFFITS, FASCIA, AND CORNER BOUNDS.

ALL SINGLE FAMILY DETACHED HOMES WILL HAVE FRONT PORCHES WITH A MINIMUM DEPTH OF 5 FEET. TOWNHOMES WILL HAVE FRONT PORCHES WITH A MINIMUM DEPTH OF 3 FEET.

ALL TRADITIONAL SINGLE FAMILY DETACHED HOMES WILL HAVE A REAR PATIO OR DECKS A MINIMUM OF 10' X 10'. ALL SINGLE FAMILY RANCHED DETACHED HOMES WILL HAVE A MINIMUM 6' X 10' COVERED PATIO.

MAIN ROOF PITCHES (EXCLUDING PORCHES) FRONTING THE STREET WILL BE AT LEAST 7:12, WITH THE EXCEPTION OF RANCH HOMES IN WHICH 6:12 SHALL BE ALLOWED.

FOR EVERY 30 FEET (OR FRACTION) OF CONTINUOUS SIDE ELEVATION (CALCULATED ON A PER FLOOR BASIS). THERE SHALL BE ONE WINDOW OR DOOR ADDED TO THE SIDE ELEVATIONS, ANY SIDING BREAK ON THE SIDE OF THE HOME. SUCH AS A FIREPLACE, SIDE PORCH, OR WALL OFFSETS MAY BE USED AS AN ALTERNATE TO

10. THERE SHALL BE A MINIMUM 12 INCH OVERHANG ON EVERY GABLE END FOR EVERY

11. GARAGES ON ALL NEO TRADITIONAL SINGLE FAMILY DETACHED HOMES AND TOWNHOMES SHALL BE ALLEY FED.

12. ALL FRONT LOADED GARAGE DOORS SHALL HAVE GLASS WINDOWS AND CARRIAGE STYLE HARDWARE.

13. ALL SINGLE FAMILY DETACHED HOMES SHALL BE RAISED FROM THE FINISHED GRADE A MINIMUM OF 18" AND SHALL HAVE STEM WALL OR RAISED SLAB FOUNDATIONS THAT SHALL BE COVERED ON ALL SIDES WITH BRICK OR STONE. AREAS UNDER PORCHES MAY BE ENCLOSED WITH LATTICE.

14. ALL SINGLE FAMILY ATTACHED HOMES SHALL BE RAISED FROM THE FINISHED GRADE A MINIMUM OF 18" AND SHALL HAVE STEM WALL OR RAISED SLAB FOUNDATIONS THAT SHALL BE COVERED ON ALL SIDES WITH BRICK OR STONE. AREAS UNDER PORCHES MAY BE ENCLOSED WITH LATTICE.

15. ANY SINGLE FAMILY HOMES WITH A CRAWL SPACE SHALL BE WRAPPED IN BRICK, OR STONE ON ALL SIDES.

16. ALL HOMES SHALL HAVE FRONT DOOR GLASS INSERTS.

17. GARAGES FOR LOTS THAT ARE TYPICALLY AT LEAST 60 FEET WIDE, THOUGH SOME MAY BE 55 FEET WIDE, WILL NOT PROTRUDE MORE THAN SIX (6) FEET FROM THE FRONT PORCH OR STOOP AND ALL GARAGE DOORS SHALL HAVE WINDOW INSERTS AND HARDWARE.

18. GARAGE DOORS FOR THE FRONT LOAD SINGLE FAMILY DETACHED HOMES SHALL BE DOUBLE GARAGE DOORS. THE WIDTH OF THE FRONT FACADE OF THE GARAGE SHALL NOT EXCEED 60% OF THE CORRESPONDING FRONT FACADE'S TOTAL WIDTH. A DECORATIVE TRELLIS ABOVE THE GARAGE DOOR WILL BE INCLUDED ON ALL SINGLE FAMILY RANCH HOMES.

UDO EXCEPTIONS

TRANSPORTATION NETWORK

AN EXCEPTION TO NOT CONSTRUCT THE FUTURE FORESTVILLE ROAD COLLECTOR IS REQUESTED. THE COLLECTOR CROSSES THIS DEVELOPMENT FOR ONLY A SMALL PORTION OF THE FUTURE

AN EXCEPTION TO ALLOW A 32' PUBLIC RIGHT OF WAY STREET SECTION, A MODIFIED ONE WAY LOCAL STREET, TO SERVE HOMES FRONTING ON OPEN SPACE AREAS IS REQUESTED.

AN EXCEPTION TO ALLOW AN 84' PUBLIC RIGHT OF WAY STREET SECTION. A MODIFIED URBAN AVENUE SECTION FROM THE STANDARDS IN THE UDO, WITH A SMALLER MEDIAN TO PROVIDE AN ENHANCED ACCESS TO THE SECONDARY AMENITY AREA.

SECTION 6.2 OF THE KNIGHTDALE UNIFIED DEVELOPMENT ORDINANCE STATES THAT LOTS LESS THAN 60' ARE EXEMPT FROM THE RESIDENTIAL CLEARING AND GRADING REQUIREMENTS OF THAT SECTION. THE PROPOSED DEVELOPMENT WILL HAVE A MAXIMUM LOT WIDTH OF 60'. LIMITED EXEMPTIONS TO THE CLEARING AND GRADING REQUIREMENTS PRESENTED IN SECTION 6.2 OF THE UDO ARE REQUESTED FOR PROPOSED LOTS THAT ARE 60' WIDE OR WIDER.

SECTION 2.7 OF THE KNIGHTDALE UNIFIED DEVELOPMENT ORDINANCE REQUIRES THAT ANY LOT LESS THAN 80' IN WIDTH BE ACCESSED VIA AN ALLEY OR REAR LANE ACCESS. ADDITIONALLY, THE UDO REQUIRES THAT SIDE SETBACKS BE A MINIMUM OF 20% OF THE LOT WIDTH (TO A MINIMUM OF 6 FEET), AND DRIVEWAY LENGTH BE A MINIMUM OF 35'. IT IS PROPOSED THAT THE MINIMUM LOT WIDTH STANDARD BE REDUCED TO 60', SIDE SETBACKS BE REDUCED TO A MINIMUM OF 3 FEET, AND DRIVEWAY LENGTHS BE REDUCED TO A MINIMUM OF 20 FEET IN ORDER TO BE ADEQUATELY DEVELOPED WITHIN THE SITE'S CONSTRAINTS.

TOWN CERTIFICATION

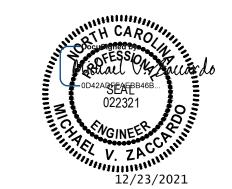
THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF

CONSTRUCTION PLANS FOR THIS PROJECT.

DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS

_ DATE: __



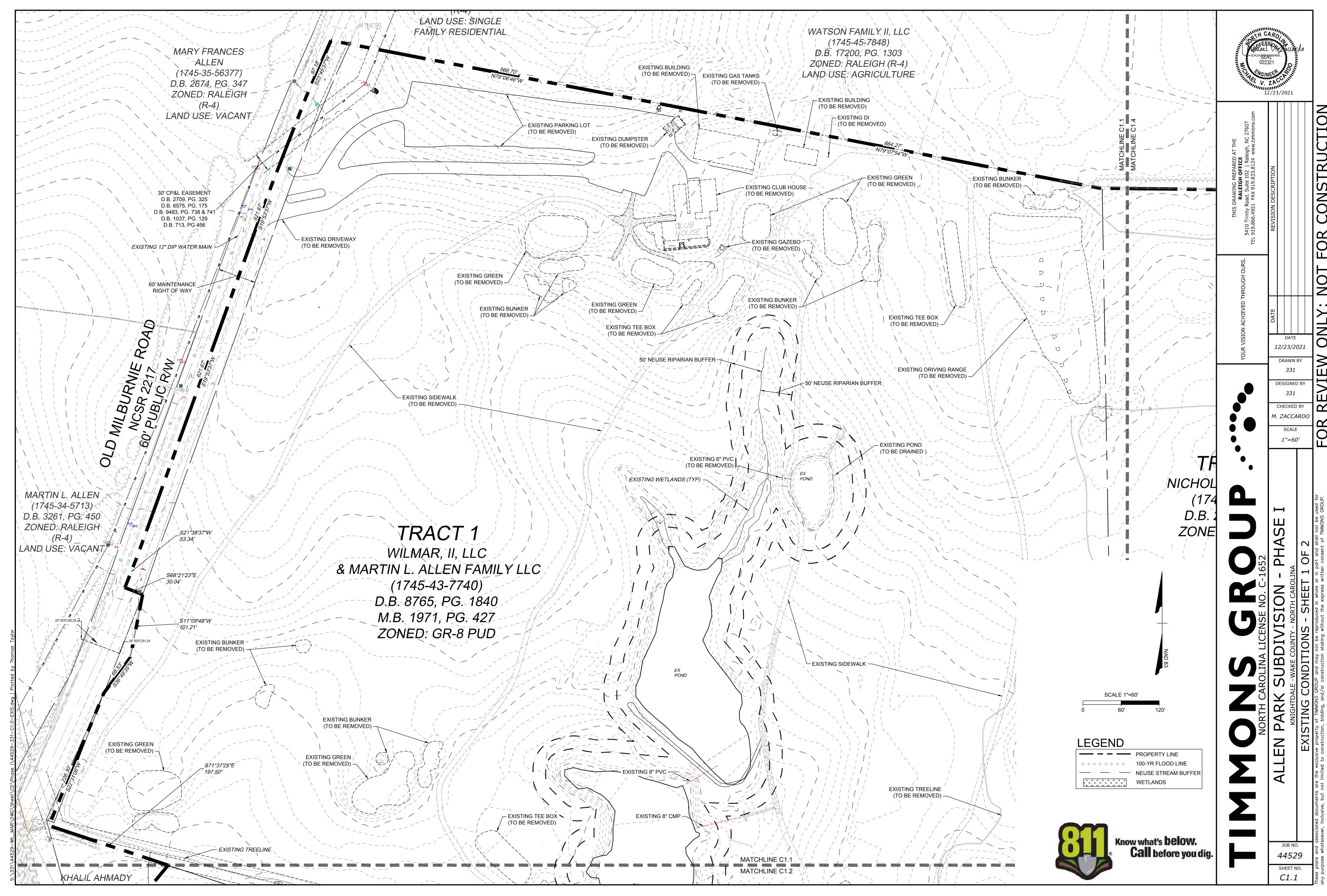


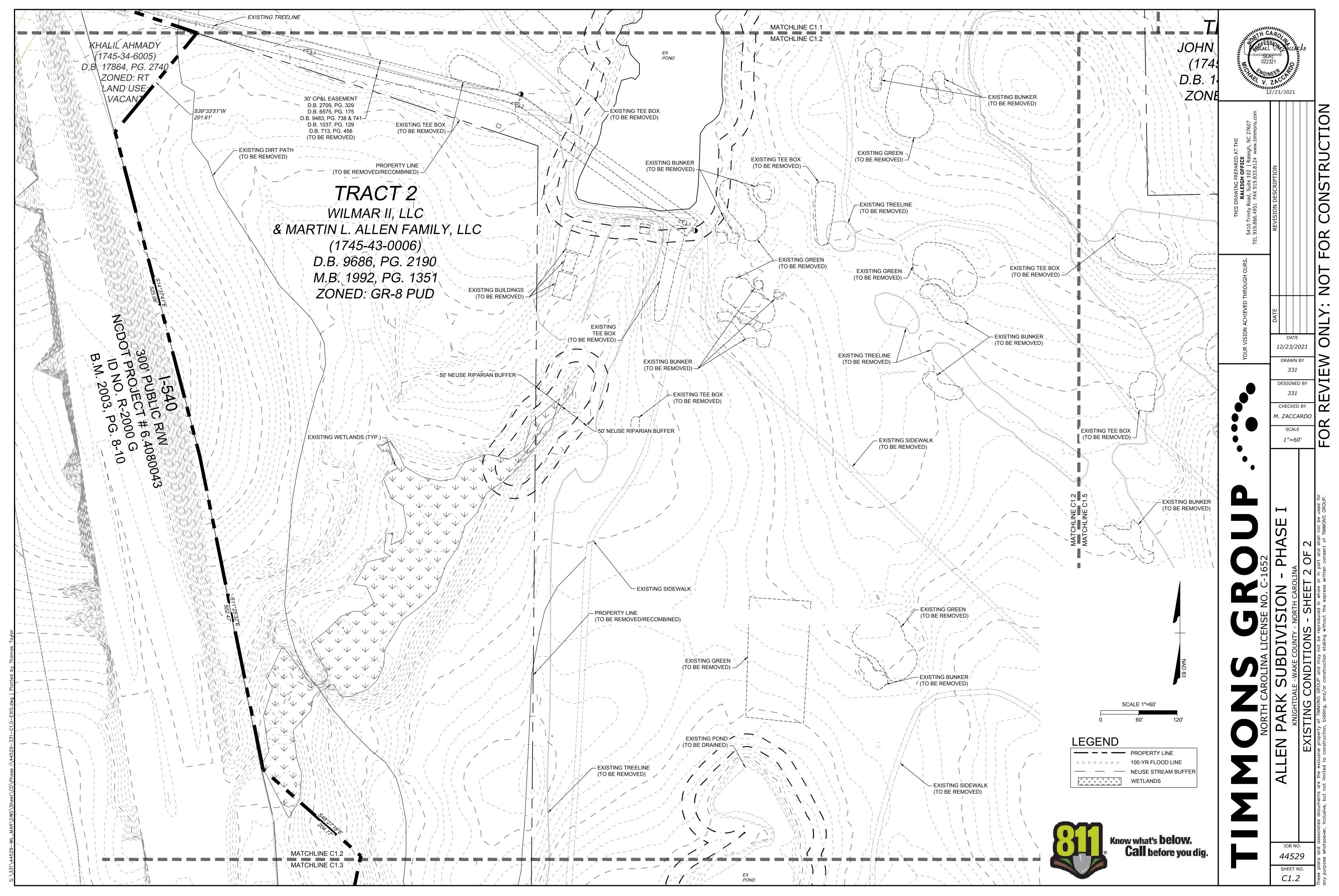
12/23/2021 331

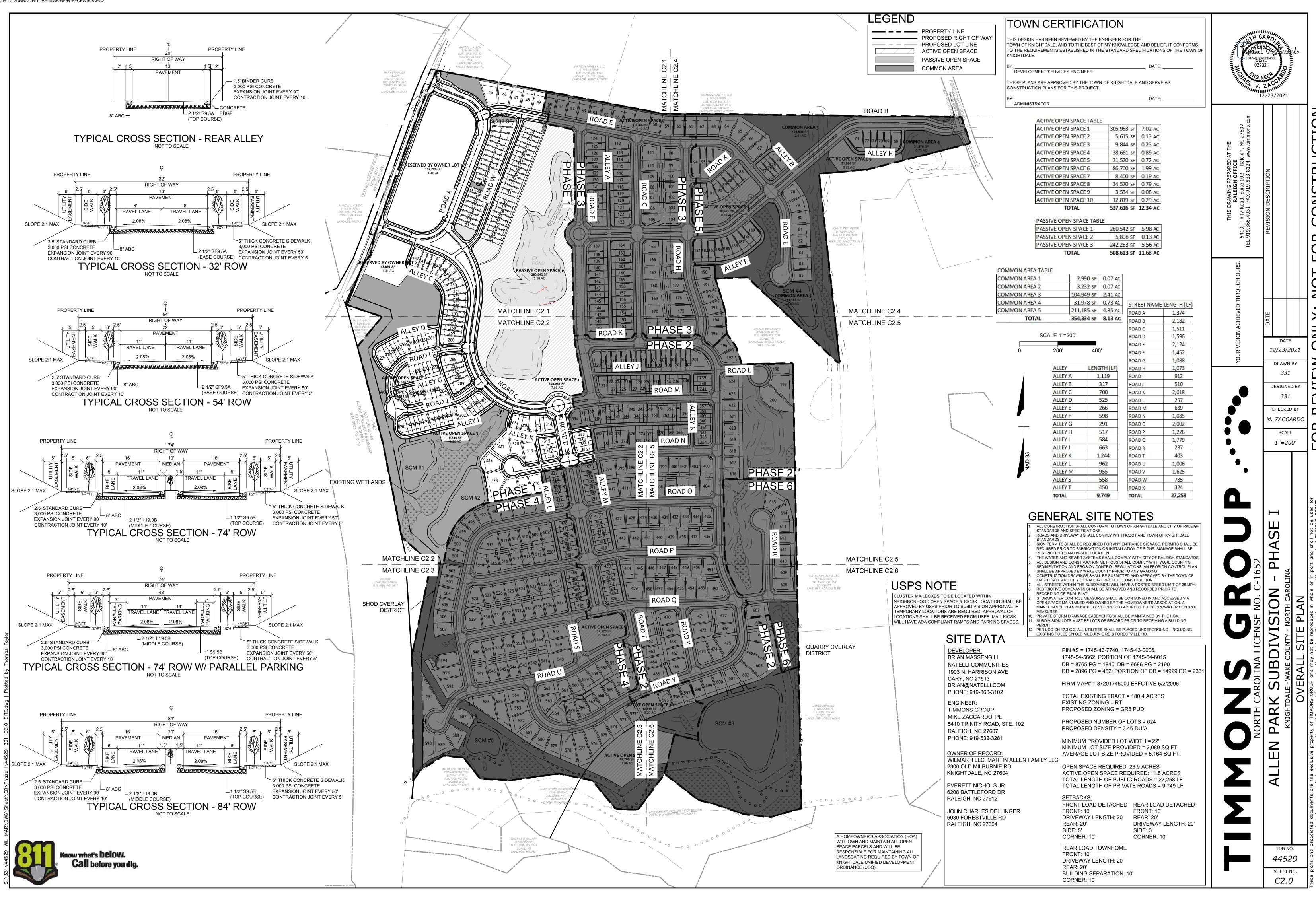
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SCALE 1"=200'

JOB NO. 44529 SHEET NO. C1.0



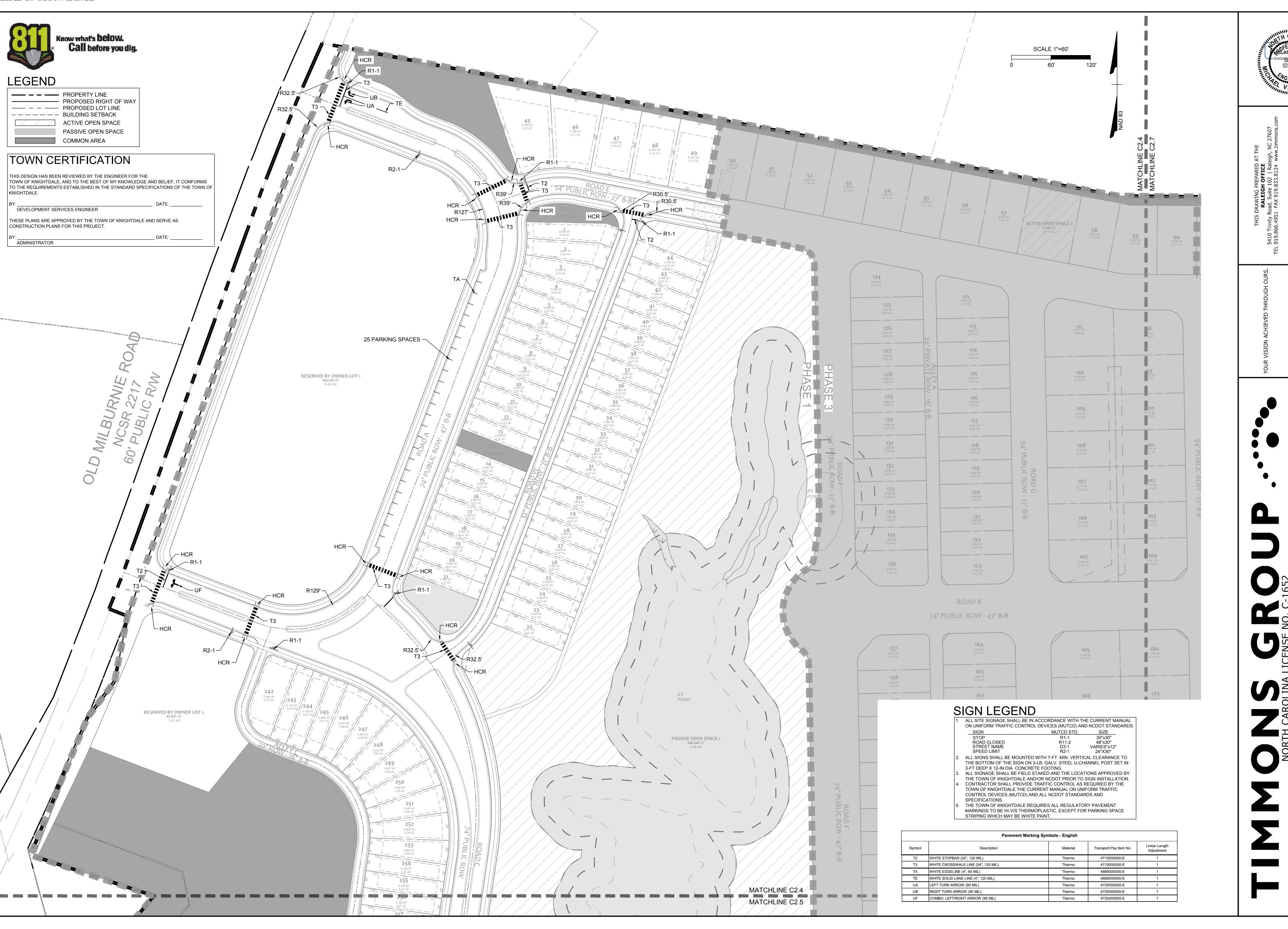






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DATE 12/23/2021 DRAWN BY

331 DESIGNED BY 331 CHECKED BY . ZACCARDO SCALE

1"=60'

44529 SHEET NO. C2.3





UTILITY NOTES

- ALL UTILITY DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES (CORDPU) STANDARDS AND SPECIFICATIONS. UTILITY DESIGN SHALL ALSO MEET FIRE FLOW REQUIREMENTS OF NCFC.
- UTILITY SIZES AND LOCATIONS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY AND ARE SUBJECT TO CHANGE BASED ON FINAL DESIGN AND CONSTRUCTION DRAWING APPROVAL THIS SHALL INCLUDE BUT NOT LIMITED TO FIRE HYDRANT LOCATIONS
- ANY EXISTING WATER AND SEWER LINES TO BE USED AS PART OF THE FINAL DESIGN OF THE PROJECT, SHALL BE LOCATED BY SURVEY, TESTED BY A LICENSED CONTRACTOR AND APPROVED BY THE CITY OF RALEIGH INSPECTOR PRIOR TO SUBMITTAL OF CONSTRUCTION
- AS PART OF CONSTRUCTION DRAWING SUBMITTAL, FIRE FLOW CALCULATIONS SHALL BE PROVIDED SHOWING COMPLIANCE WITH NCFC. PROJECT MAY BE DEVELOPED IN PHASES AND ALL PHASES SHALL BE REQUIRED TO MEET THE MINIMUM REQUIRED FIRE FLOWS PER
- OCCUPANCY PROPOSED IN EACH PHASE. AN APPROVED WATER SUPPLY FOR FIRE SUPPRESSION (TEMPORARY OR PERMANENT) SHALL
- BE PROVIDED AS SOON AS COMBUSTIBLE MATERIALS ARRIVE ON SITE.
- PREPARED BY NC PROFESSIONAL ENGINEER. RIGHT OF WAY AND/OR EASEMENT DEDICATION PLAT IS REQUIRED FOR THIS PROJECT
- (PRIOR TO CITY ACCEPTANCE OF UTILITIES). ALL NECESSARY WETLAND, RIPARIAN BUFFER AND FLOODPLAIN PERMITS FROM USACE,
- NCDWQ & FEMA SHALL BE OBTAINED PRIOR TO CONSTRUCTION. PROJECT SHALL EXTEND PUBLIC WATER MAINS ALONG ALL INTERIOR AND ABUTTING RIGHT
- OF WAYS OF DEVELOPMENT. 10. FIRE HYDRANT ASSEMBLIES SHALL BE INSTALLED AT EVERY INTERSECTION AND AT 500' (RESIDENTIAL) MAX INTERVALS ALONG SITE FRONTAGE.
- 11. ALL MAINS UP TO 12 INCHES IN SIZE SHALL BE DESIGNED WITH A BLOW-OFF ASSEMBLY THE SAME SIZE AS THE DIAMETER OF THE PIPE.
- 12. ALL WATER MAINS SHALL BE PRESSURE CLASS OR THICKNESS CLASS DUCTILE IRON PIPE
- DESIGNED IN ACCORDANCE WITH AWWA STANDARD C-150.
- 13. PROJECT SHALL EXTEND PUBLIC GRAVITY SEWER TO PERIPHERY OF DEVELOPMENT BASED ON NATURAL TOPOGRAPHY.
- 14. ALL CITY OF RALEIGH SANITARY SEWER EASEMENTS SHALL BE A MINIMUM OF 30 FEET
- 15. THE SANITARY SEWER DESIGN SHALL BE EVALUATED DURING THE CONSTRUCTION DRAWING REVIEW TO ENSURE ADJACENT PROPERTIES HAVE ACCESS TO SANITARY SEWER WHERE FEASIBLE AND IN COMPLIANCE WITH THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
- 16. ALL OFF-SITE EASEMENTS SHALL BE ACQUIRED BY THE DEVELOPER. THESE OFF-SITE EASEMENTS SHALL BE RECORDED BY MAP AND BY DEED OF EASEMENT PRIOR TO CONSTRUCTION APPROVAL. THE EASEMENTS SHALL BE DEDICATED TO THE CITY OF RALEIGH
- AND ENTITLED "CITY OF RALEIGH SANITARY SEWER EASEMENT" 17. MAINTAIN APPROPRIATE COVER AND SEPARATION ON UTILITIES AND LABEL IN PROFILES; ANY UTILITY CROSSINGS ARE SUBJECT TO MINIMUM REQUIREMENTS.
- 18. CONSTRUCTION APPROVAL WILL BE REQUIRED FOR ANY EXTENSIONS OF PUBLIC WATER OR
- 19. PLAT RECORDATION REQUIRED AFTER CONSTRUCTION APPROVAL PRIOR TO BUILDING
- 20. DOT ENCROACHMENT AGREEMENT REQUIRED.
- 21. PRIVATE WATER SERVICES SIZED $\frac{3}{4}$ " 2" SHOULD BE TYPE "K" SOFT COPPER AND IN ACCORDANCE WITH PU HANDBOOK, APP. B, STANDARD WATER DETAIL W-23 AND W-25. IF WATER METERS CANNOT BE LOCATED WITHIN THE RIGHT-OF-WAY THEY MUST BE WITHIN RECORDED "CITY OF RALEIGH WATER MAIN EASEMENTS."

CORPUD STANDARD UTILITY NOTES:

STANDARD UTILITY NOTES (AS APPLICABLE):

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION) **UTILITY SEPARATION REQUIREMENTS:**

A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATER MAIN SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL

- WHEN INSTALLING WATER &/OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10' IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS. THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR.
- ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, PVC MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF
- CROSSING MUST BE SPECIFIED & INSTALLED TO WATER MAIN SPECIFICATIONS 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER
- FACILITIES, UNLESS PVC MATERIAL IS SPECIFIED FOR SANITARY SEWER MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS.
- WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY PVC MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49) ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL
- SEPARATION REQUIRED ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR
- THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION
- CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES &
- THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
- 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS
- IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
- INSTALL 3/4" COPPER* WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATER MAIN EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE
- INSTALL 4" PVC* SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM
- PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE
- NEXT UPSTREAM MANHOLE 10. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE &/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO
- NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION
- 12. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE
- 13. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR

UTILITY CONSTRUCTION APPROVAL IS REQUIRED FOR PROJECT DEVELOPMENT

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, CITY OF RALEIGH AND NCDOT STANDARDS, SPECIFICATIONS, AND DETAILS.



12/23/2021 331

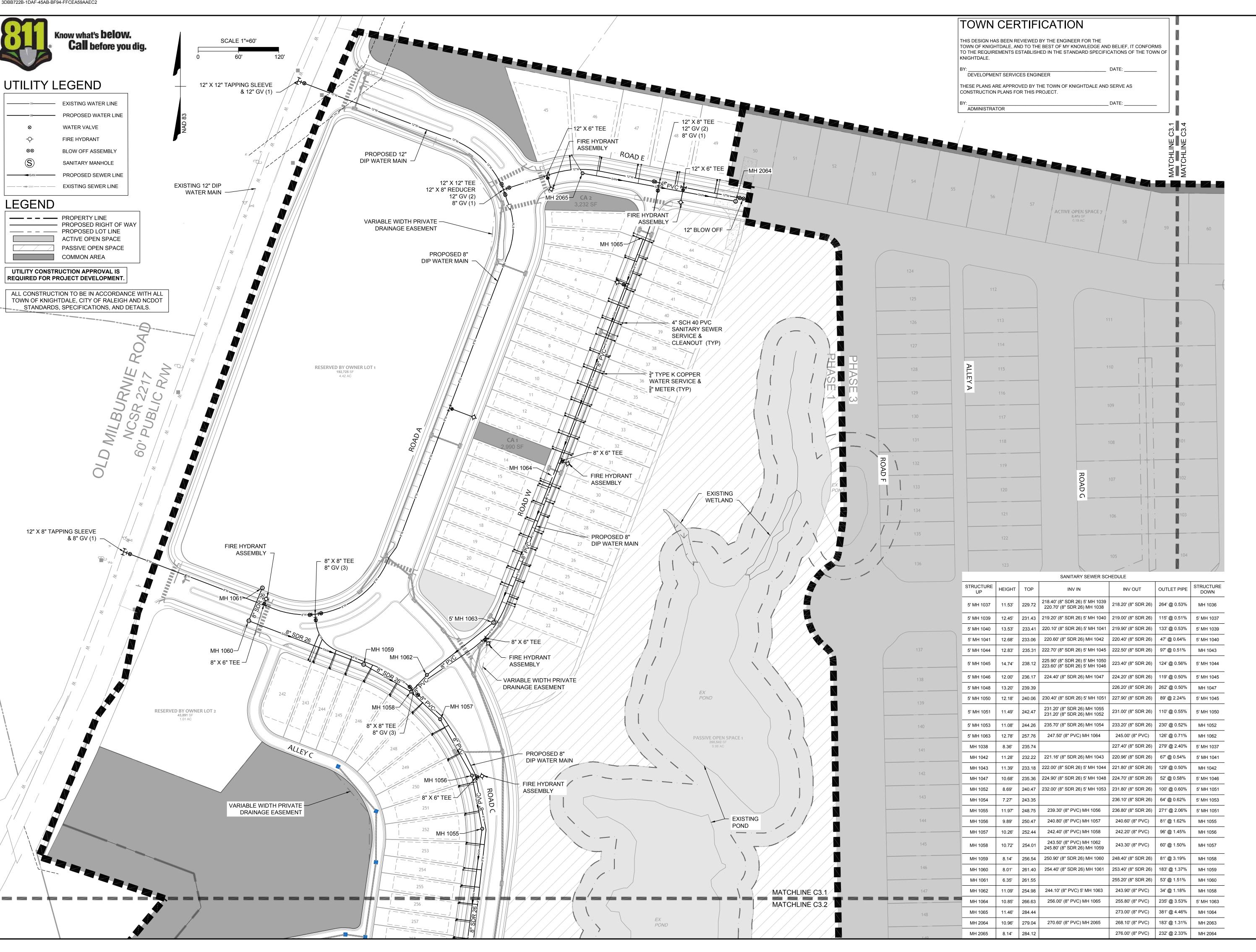
DESIGNED BY CHECKED BY ZACCARD

SCALE

1"=200'

44529

SHEET NO. C3.0



DATE

12/23/2021

DRAWN BY

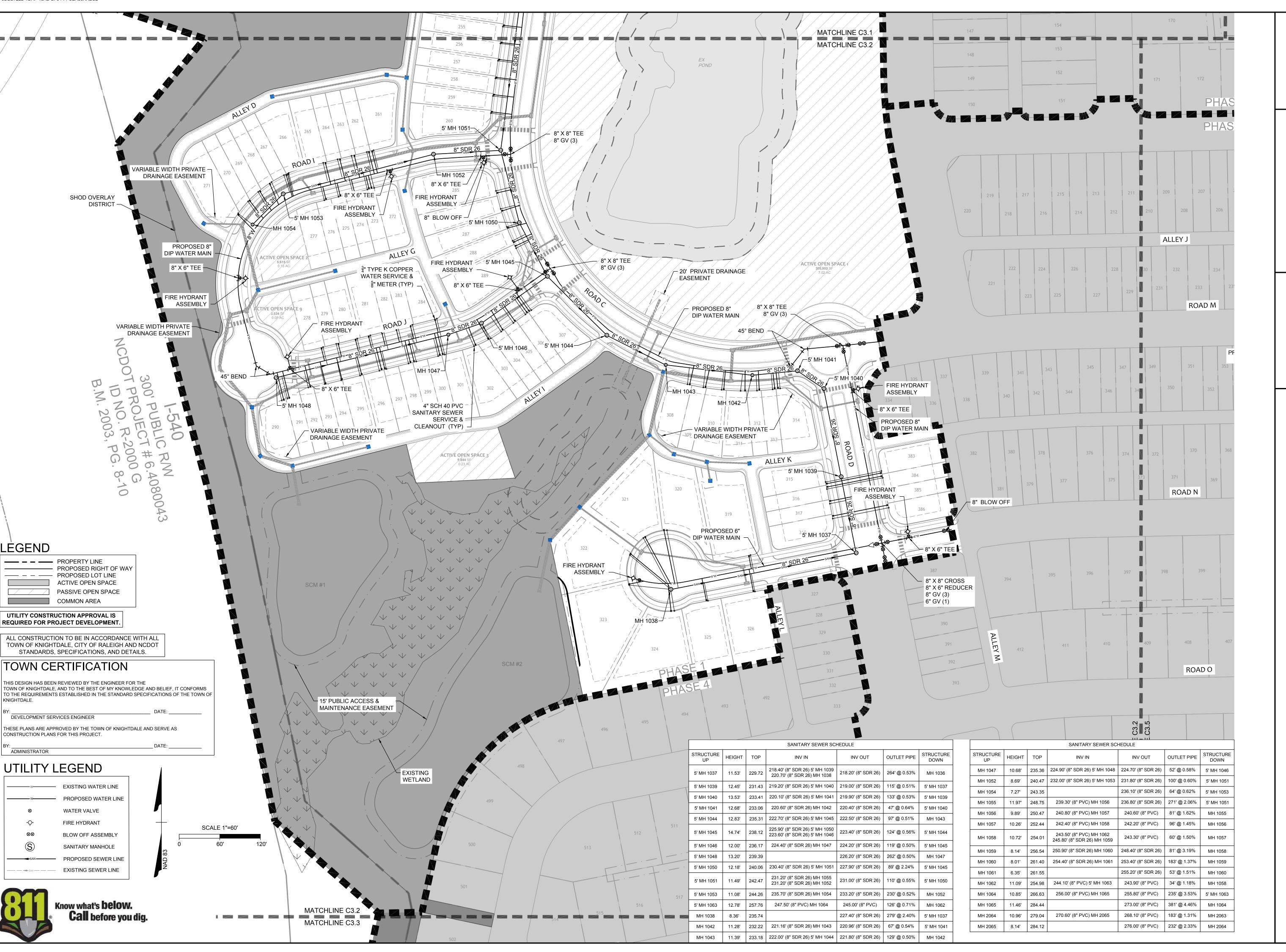
331

DESIGNED BY 331

CHECKED BY ZACCARD

> SCALE 1"=60'

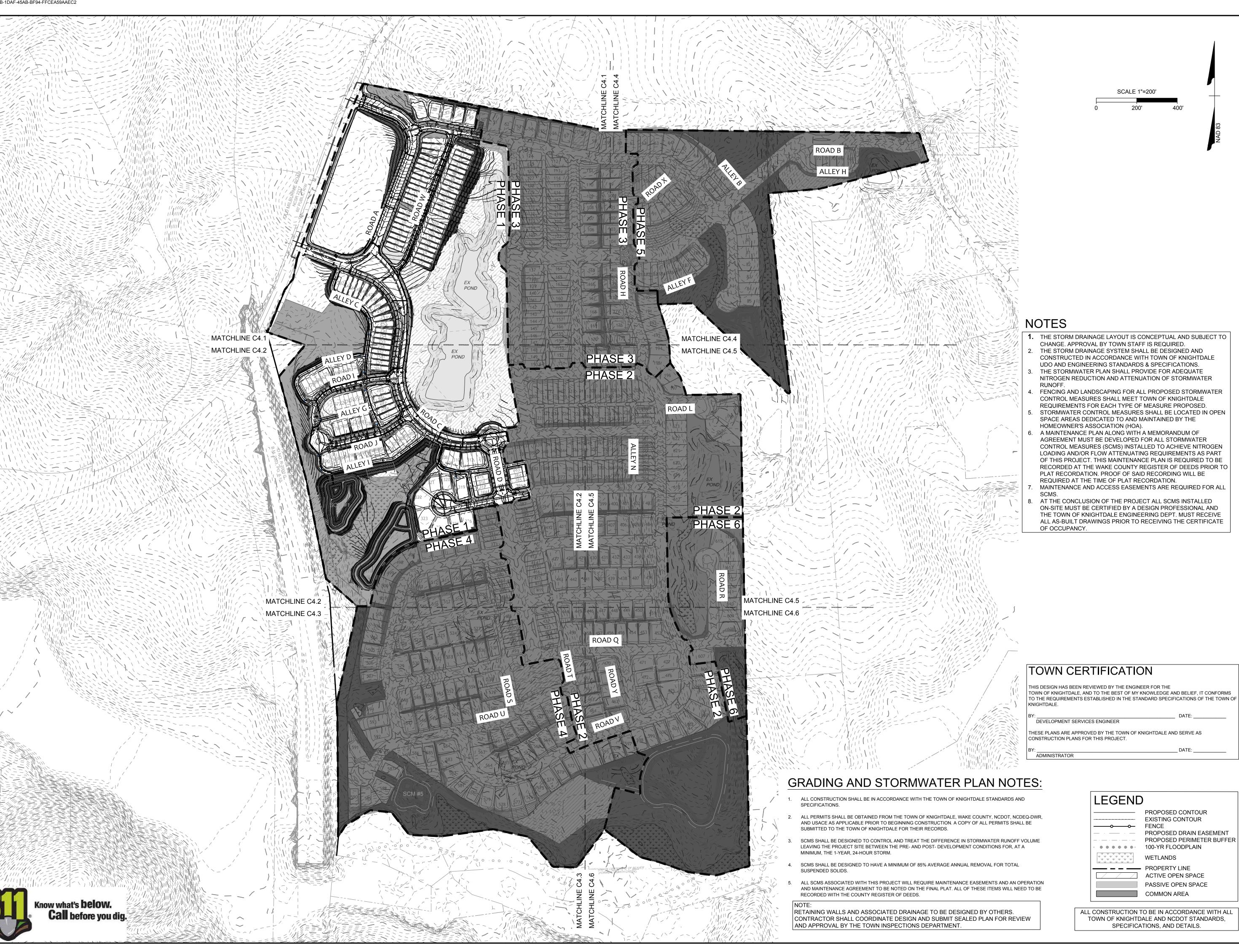
JOB NO. 44529 SHEET NO. C3.1



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DESIGNED BY 331 CHECKED BY . ZACCARD SCALE 1"=60'

JOB NO. 44529 SHEET NO. C3.2



SCALE 1"=200'

12/23/2021

DESIGNED BY

CHECKED BY

SCALE 1"=200'

44529 SHEET NO.

C4.0

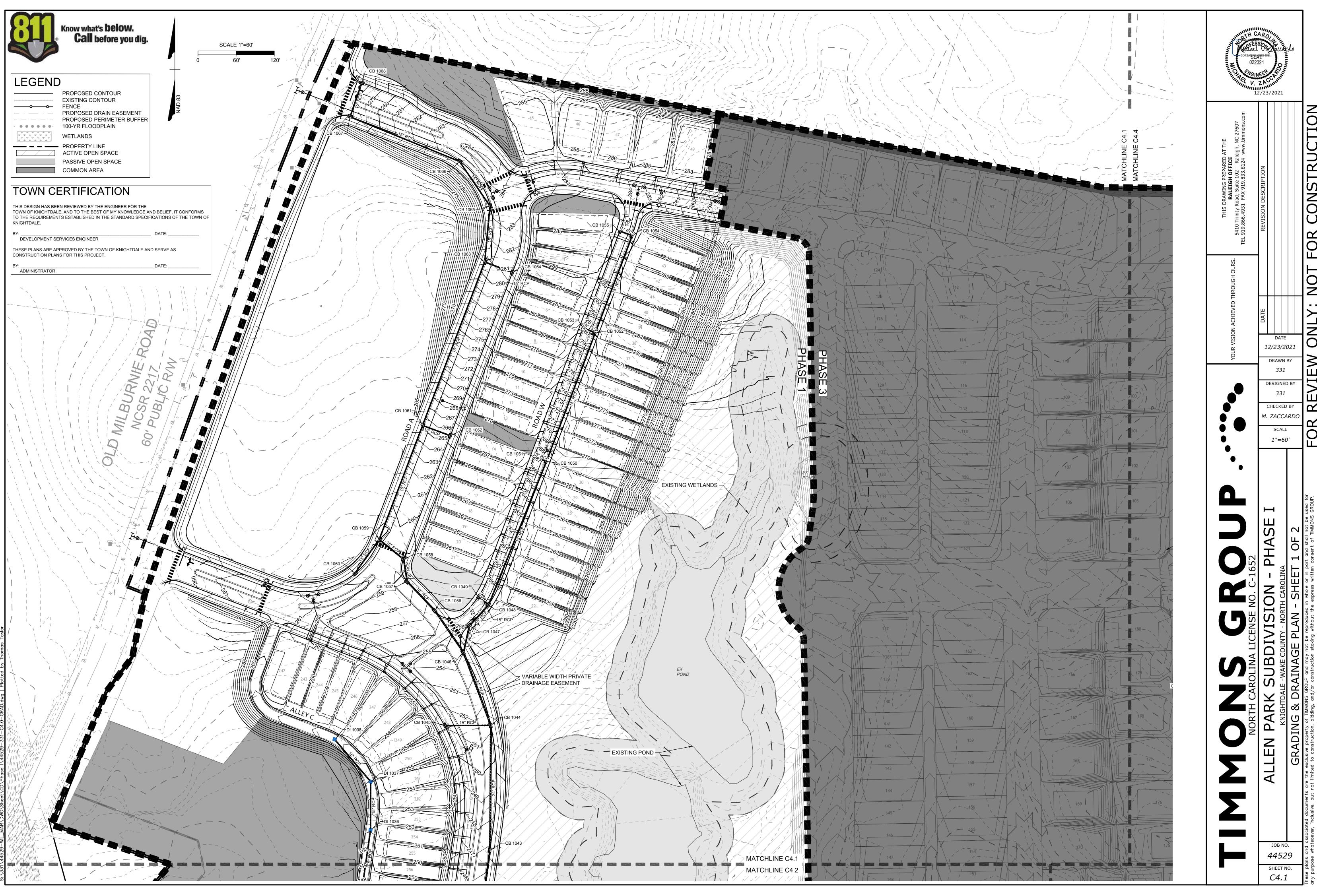
EXISTING CONTOUR PROPOSED DRAIN EASEMENT PROPOSED PERIMETER BUFFER 100-YR FLOODPLAIN • • • • • • WETLANDS PROPERTY LINE ACTIVE OPEN SPACE PASSIVE OPEN SPACE

COMMON AREA

PROPOSED CONTOUR

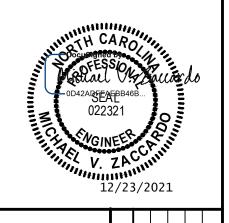
ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT STANDARDS, SPECIFICATIONS, AND DETAILS.

LEGEND



L





12/23/2021

CHECKED BY

1"=60'

JOB NO. 44529 SHEET NO. C4.2

STORM DRAINAGE SCHEDULE						
STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 1006	11.23'	238.38	227.40' (24" RCP) CB 1013 228.15' (15" RCP) CB 1007	227.40' (24" RCP)	99' @ 0.61%	DI 1004
CB 1007	8.54'	238.45		230.10' (15" RCP)	27' @ 7.19%	CB 1006
CB 1013	6.82'	235.06	228.95' (18" RCP) CB 1015 229.20' (15" RCP) CB 1014	228.45' (24" RCP)	161' @ 0.65%	CB 1006
CB 1014	5.40'	235.07		229.85' (15" RCP)	27' @ 2.37%	CB 1013
CB 1015	6.59'	235.78	229.40' (18" RCP) CB 1017 229.65' (15" RCP) DI 1016	229.40' (18" RCP)	64' @ 0.71%	CB 1013
CB 1017	7.85'	237.71	230.30' (15" RCP) CB 1018	230.05' (18" RCP)	124' @ 0.52%	CB 1015
CB 1018	7.40'	237.72	230.50' (15" RCP) CB 1019	230.50' (15" RCP)	27' @ 0.74%	CB 1017
CB 1019	7.15'	239.37	232.40' (15" RCP) CB 1020	232.40' (15" RCP)	45' @ 4.18%	CB 1018
CB 1020	6.69'	239.40		232.90' (15" RCP)	47' @ 1.06%	CB 1019
CB 1022	12.40'	240.77	228.70' (36" RCP) CB 1023	228.70' (36" RCP)	75' @ 3.86%	DI 1004
CB 1023	9.42'	241.09	232.00' (36" RCP) CB 1024	232.00' (36" RCP)	80' @ 4.13%	CB 1022
CB 1024	9.22'	241.09	232.20' (36" RCP) DI 1011	232.20' (36" RCP)	27' @ 0.74%	CB 1023
CB 1025	10.79'	243.41	232.95' (36" RCP) CB 1027 234.70' (15" RCP) DI 1026	232.95' (36" RCP)	100' @ 0.50%	DI 1011
CB 1027	11.31'	244.23	233.25' (36" RCP) CB 1028	233.25' (36" RCP)	49' @ 0.61%	CB 1025
CB 1028	10.80'	244.07	233.60' (36" RCP) CB 1030 235.35' (15" RCP) CB 1029	233.60' (36" RCP)	64' @ 0.55%	CB 1027
CB 1029	9.08'	243.78		236.70' (15" RCP)	29' @ 4.64%	CB 1028
CB 1030	5.70'	240.00	234.30' (36" RCP) CB 1039 236.05' (15" RCP) DI 1032 236.05' (15" RCP) DI 1031	234.30' (36" RCP)	171' @ 0.41%	CB 1028
CB 1039	7.28'	241.93	234.95' (36" RCP) CB 1041 236.70' (15" RCP) CB 1040	234.95' (36" RCP)	92' @ 0.71%	CB 1030
CB 1040	5.59'	241.94		238.35' (15" RCP)	27' @ 6.11%	CB 1039
CB 1041	8.96'	243.87	235.20' (36" RCP) CB 1042	235.20' (36" RCP)	51' @ 0.49%	CB 1039
CB 1042	8.90'	244.06	236.45' (24" RCP) CB 1043	235.45' (36" RCP)	48' @ 0.52%	CB 1041
CB 1043	8.02'	247.27	239.50' (24" RCP) CB 1044	239.50' (24" RCP)	137' @ 2.22%	CB 1042
CB 1044	8.97'	251.67	242.95' (24" RCP) CB 1046 243.70' (15" RCP) CB 1045	242.95' (24" RCP)	196' @ 1.76%	CB 1043
CB 1045	7.03'	251.54		244.70' (15" RCP)	73' @ 1.37%	CB 1044
CB 1046	8.82'	254.47	246.40' (18" RCP) CB 1047 245.90' (24" RCP) CB 1056	245.90' (24" RCP)	122' @ 2.41%	CB 1044
CB 1047	7.97'	256.19	248.65' (15" RCP) CB 1048	248.40' (18" RCP)	43' @ 4.67%	CB 1046
CB 1048	7.62'	258.14	250.70' (15" RCP) CB 1050 250.70' (15" RCP) CB 1049	250.70' (15" RCP)	45' @ 4.60%	CB 1047
CB 1049	9.30'	258.20		250.90' (15" RCP)	21' @ 0.95%	CB 1048
CB 1050	7.62'	267.44	260.00' (15" RCP) CB 1052 260.00' (15" RCP) CB 1051	260.00' (15" RCP)	243' @ 3.82%	CB 1048
CB 1051	9.15'	267.45		260.30' (15" RCP)	21' @ 1.43%	CB 1050

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE
UP	ПЕІВПІ	106	IIIV IIV	1111 001	OUTLET FIFE	DOWN
CB 1052	11.77'	280.53	268.95' (15" RCP) CB 1054 268.95' (15" RCP) CB 1053	268.95' (15" RCP)	216' @ 4.15%	CB 1050
CB 1053	13.52'	280.62		269.10' (15" RCP)	21' @ 0.71%	CB 1052
CB 1054	12.58'	284.59	272.20' (15" RCP) CB 1055	272.20' (15" RCP)	164' @ 1.98%	CB 1052
CB 1055	12.28'	284.59		272.50' (15" RCP)	21' @ 1.43%	CB 1054
CB 1056	8.27'	256.94	249.42' (18" RCP) CB 1057	248.92' (24" RCP)	80' @ 3.77%	CB 1046
CB 1057	8.08'	258.88	251.00' (18" RCP) CB 1058	251.00' (18" RCP)	63' @ 2.52%	CB 1056
CB 1058	7.81'	259.40	251.80' (18" RCP) CB 1059	251.80' (18" RCP)	35' @ 2.28%	CB 1057
CB 1059	7.44'	259.73	252.75' (15" RCP) CB 1061 252.75' (15" RCP) CB 1060	252.50' (18" RCP)	50' @ 1.41%	CB 1058
CB 1060	8.66'	260.06		253.40' (15" RCP)	65' @ 1.00%	CB 1059
CB 1061	7.21'	265.67	258.65' (15" RCP) CB 1063 258.65' (15" RCP) CB 1062	258.65' (15" RCP)	192' @ 3.07%	CB 1059
CB 1062	8.68'	265.68		259.00' (15" RCP)	47' @ 0.74%	CB 1061
CB 1063	12.63'	281.15	268.70' (15" RCP) CB 1065 268.70' (15" RCP) CB 1064	268.70' (15" RCP)	275' @ 3.66%	CB 1061
CB 1064	12.13'	281.15		269.20' (15" RCP)	47' @ 1.06%	CB 1063
CB 1065	12.53'	283.84	271.50' (15" RCP) CB 1066	271.50' (15" RCP)	88' @ 3.17%	CB 1063
CB 1066	12.22'	284.03	272.00' (15" RCP) CB 1067	272.00' (15" RCP)	85' @ 0.59%	CB 1065
CB 1067	5.35'	278.16	273.00' (15" RCP) CB 1068	273.00' (15" RCP)	186' @ 0.54%	CB 1066
CB 1068	4.66'	277.88		273.40' (15" RCP)	57' @ 0.70%	CB 1067
CB 2003	10.44'	237.14	226.70' (15" RCP) CB 2004	226.70' (15" RCP)	112' @ 0.58%	DI 2002
CB 2004	6.23'	233.73	227.50' (15" RCP) CB 2005	227.50' (15" RCP)	152' @ 0.53%	CB 2003
CB 2005	6.20'	233.71		227.70' (15" RCP)	27' @ 0.74%	CB 2004
CB 2011	6.83'	234.18	227.35' (15" RCP) CB 2012	227.35' (15" RCP)	30' @ 0.48%	DI 2010
CB 2012	6.76'	234.16		227.58' (15" RCP)	47' @ 0.50%	CB 2011
CB 2013	6.88'	232.38	226.00' (36" RCP) CB 2017 227.75' (15" RCP) CB 2014	225.50' (42" RCP)	101' @ 0.55%	DI 2010
CB 2014	4.98'	233.13	228.15' (15" RCP) CB 2015	228.15' (15" RCP)	80' @ 0.50%	CB 2013
CB 2015	4.81'	233.31	228.50' (15" RCP) CB 2016	228.50' (15" RCP)	69' @ 0.51%	CB 2014
CB 2016	6.51'	233.31		228.80' (15" RCP)	57' @ 0.53%	CB 2015
CB 2017	5.88'	232.38	226.50' (36" RCP) CB 2020	226.50' (36" RCP)	47' @ 1.06%	CB 2013
CB 2019	4.73'	238.14		233.60' (15" RCP)	47' @ 3.72%	CB 2020
CB 2020	10.82'	238.17	229.35' (36" RCP) CB 2018 231.85' (15" RCP) CB 2019	229.35' (36" RCP)	214' @ 1.33%	CB 2017
DI 1001	13.36'	238.21	224.85' (36" RCP) DI 1003 226.60' (15" RCP) DI 1002	224.85' (36" RCP)	56' @ 8.65%	FES 1000

	1	1	STORM DRAINAGE S	THEDULE	Γ	1
STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURI DOWN
DI 1002	8.69'	240.51		232.00' (15" RCP)	116' @ 4.67%	DI 1001
DI 1003	13.66'	238.57	225.25' (36" RCP) DI 1004	225.25' (36" RCP)	49' @ 0.81%	DI 1001
DI 1004	14.55'	240.02	225.80' (36" RCP) CB 1022 226.80' (24" RCP) CB 1006	225.80' (36" RCP)	73' @ 0.75%	DI 1003
DI 1011	8.86'	241.12	232.45' (36" RCP) CB 1025 234.20' (15" RCP) DI 1012	232.45' (36" RCP)	34' @ 0.73%	CB 1024
DI 1012	5.41'	242.72		237.50' (15" RCP)	117' @ 2.81%	DI 1011
DI 1016	6.32'	236.34		230.20' (15" RCP)	59' @ 0.93%	CB 1015
DI 1026	4.49'	242.30		238.00' (15" RCP)	56' @ 5.88%	CB 1025
DI 1031	4.22'	240.22		238.00' (15" RCP)	61' @ 3.18%	CB 1030
DI 1032	4.44'	242.30	238.05' (15" RCP) DI 1033	238.05' (15" RCP)	34' @ 5.85%	CB 1030
DI 1033	5.13'	246.40	241.45' (15" RCP) DI 1036 241.45' (15" RCP) DI 1034	241.45' (15" RCP)	77' @ 4.40%	DI 1032
DI 1034	5.53'	246.99	241.65' (15" RCP) DI 1035	241.65' (15" RCP)	30' @ 0.67%	DI 1033
DI 1035	4.87'	247.48		242.80' (15" RCP)	172' @ 0.67%	DI 1034
DI 1036	6.84'	251.10	244.45' (15" RCP) DI 1037	244.45' (15" RCP)	113' @ 2.66%	DI 1033
DI 1037	7.20'	253.96	246.95' (15" RCP) DI 1038	246.95' (15" RCP)	76' @ 3.29%	DI 1036
DI 1038	7.76'	256.32		248.75' (15" RCP)	87' @ 2.06%	DI 1037
DI 2001	4.74'	228.14	223.40' (42" RCP) DI 2002	223.40' (42" RCP)	75' @ 0.53%	FES 2000
DI 2002	6.10'	229.90	223.80' (42" RCP) DI 2006 226.05' (15" RCP) CB 2003	223.80' (42" RCP)	65' @ 0.61%	DI 2001
DI 2006	9.82'	234.32	224.50' (42" RCP) DI 2010 226.75' (15" RCP) DI 2007	224.50' (42" RCP)	148' @ 0.47%	DI 2002
DI 2007	7.30'	235.11	228.00' (15" RCP) DI 2008	228.00' (15" RCP)	46' @ 2.72%	DI 2006
DI 2008	7.35'	235.47	228.30' (15" RCP) DI 2009 228.30' (15" RCP) DI 2060	228.30' (15" RCP)	50' @ 0.60%	DI 2007
DI 2009	5.57'	234.08		228.70' (15" RCP)	63' @ 0.64%	DI 2008
DI 2010	8.69'	233.64	224.95' (42" RCP) CB 2013 227.20' (15" RCP) CB 2011	224.95' (42" RCP)	95' @ 0.47%	DI 2006
DI 2060	4.51'	232.82		228.50' (15" RCP)	28' @ 0.71%	DI 2008
FES 1000	???'	223.33	220.00' (36" RCP) DI 1001			
FES 2000	???'	226.88	223.00' (42" RCP) DI 2001			

STORM PIPE TABLE								
PIPE#	DIA	FROM - TO	UPSTREAM INVERT	DOWNSTREAM INVERT	SLOPE	LENGTH	DESCRIPTION	
JLVERT 1A	36"	-	257.88	253.90	2.28%	174.88 LF	36 inch RCP	
JLVERT 1B	36"	-	258.00	254.00	2.27%	176.20 LF	36 inch RCP	
ULVERT 2	30"	-	226.50	223.50	2.20%	136.44 LF	30 inch RCP	
JLVERT 3A	36"	-	214.00	213.00	0.74%	134.72 LF	36 inch RCP	
JLVERT 3B	36"	-	214.00	213.00	0.79%	125.81 LF	36 inch RCP	
JLVERT 3C	36"	-	214.00	213.00	0.84%	119.59 LF	36 inch RCP	

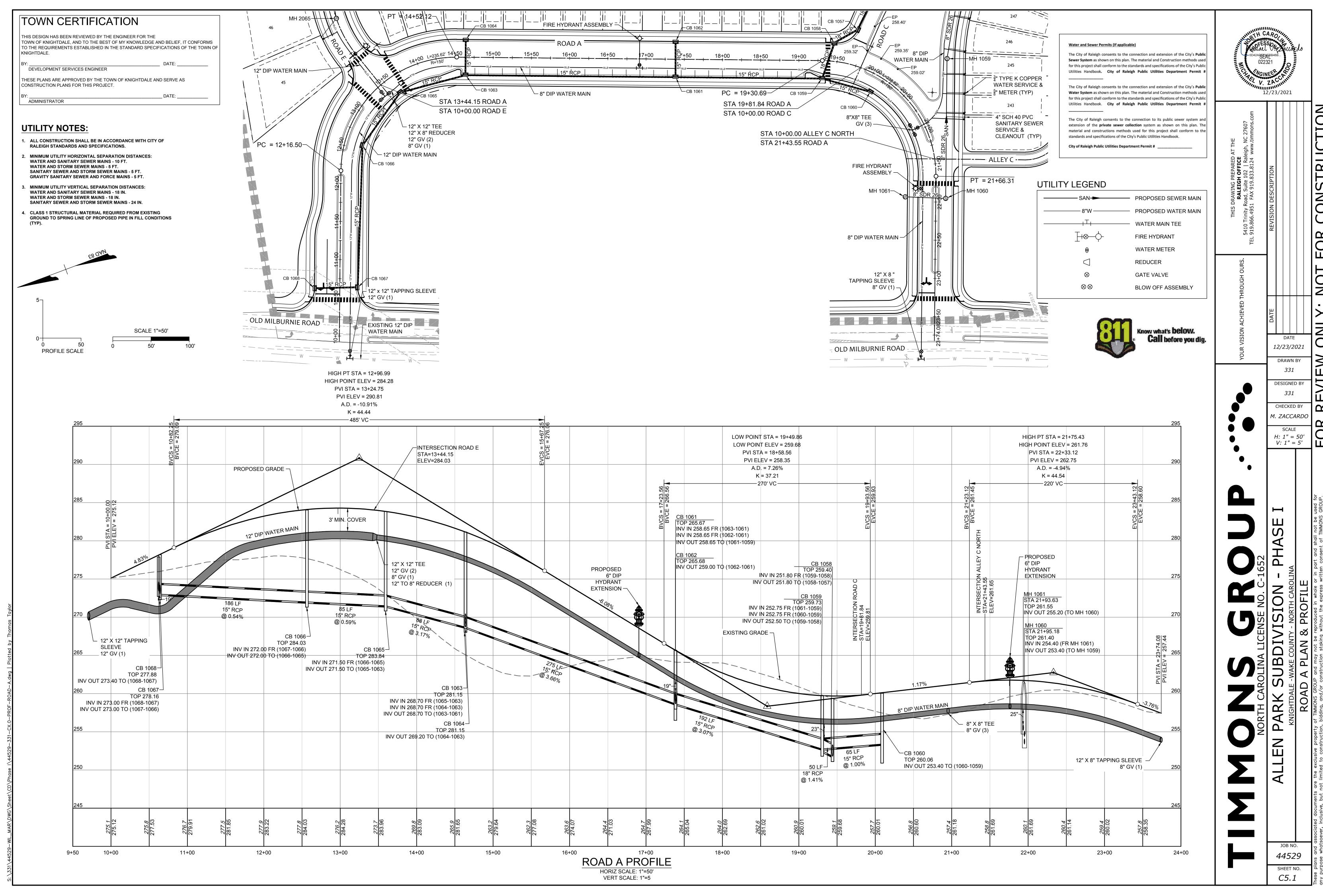
TOWN CERTIFICATION	
THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AN TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFIC KNIGHTDALE.	•
BY:	DATE:
DEVELOPMENT SERVICES ENGINEER	
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND CONSTRUCTION PLANS FOR THIS PROJECT.	SERVE AS
BY:	DATE:
ADMINISTRATOR	

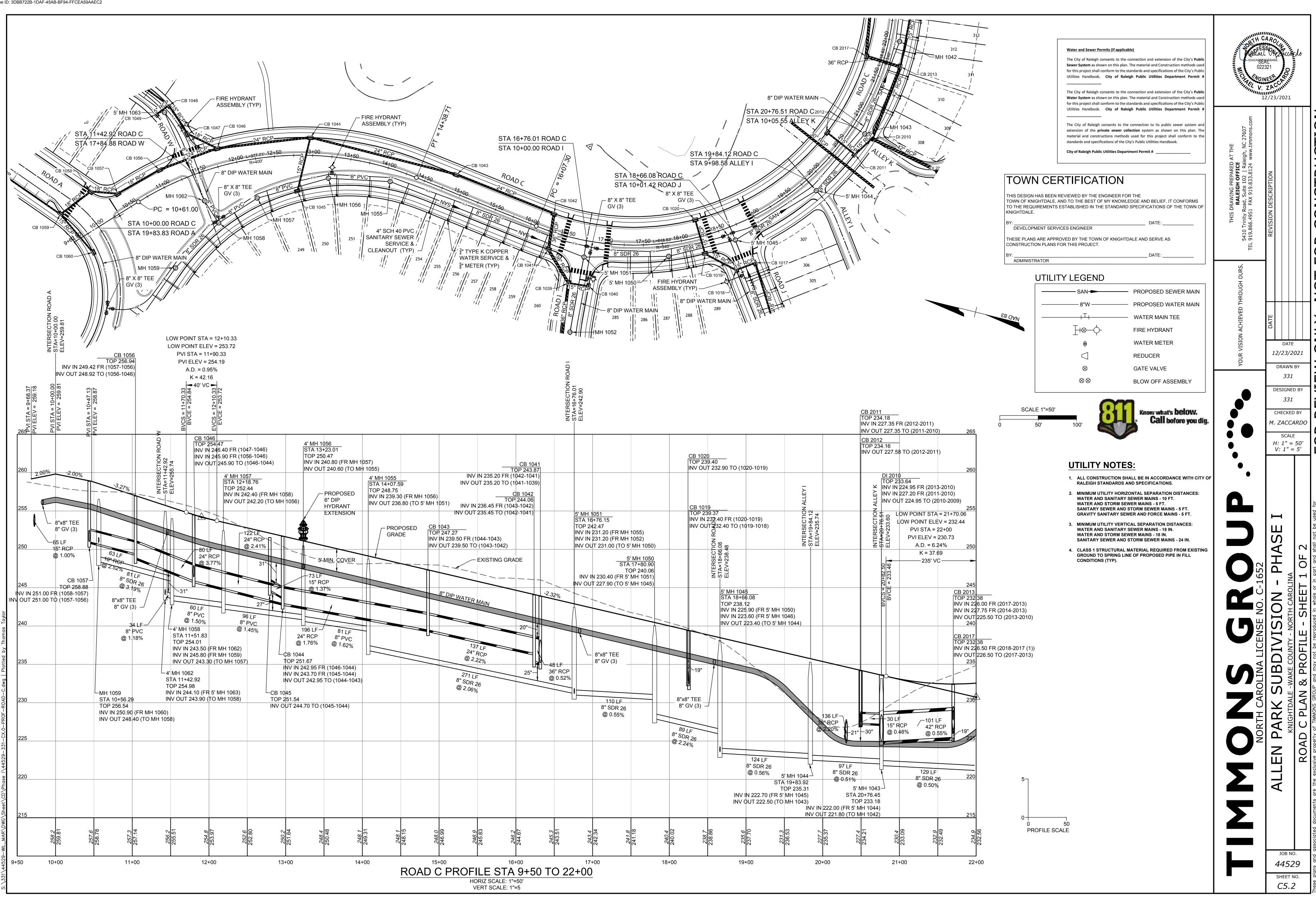


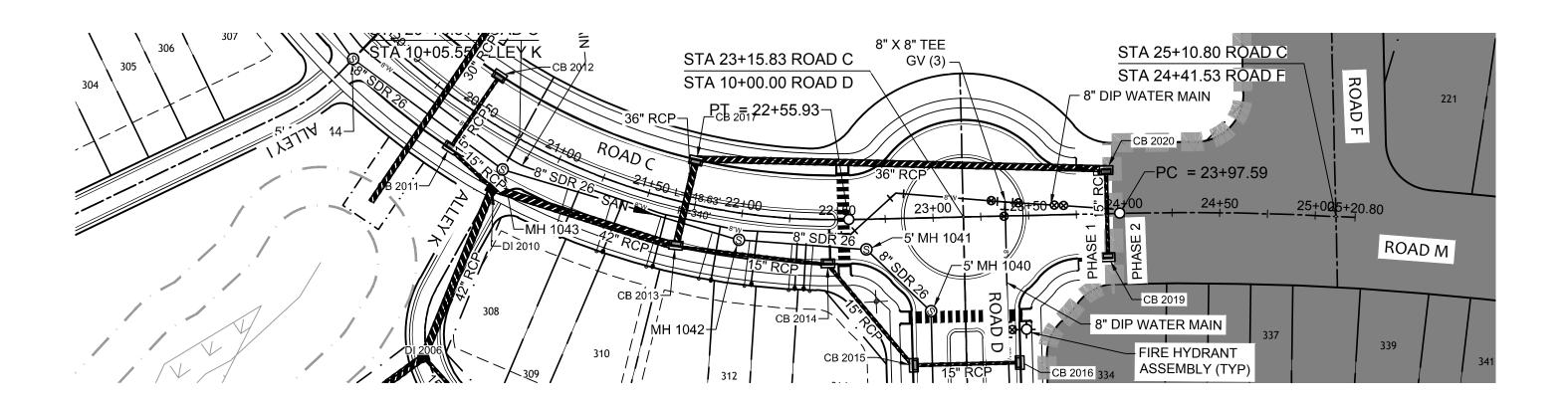
JOB NO.

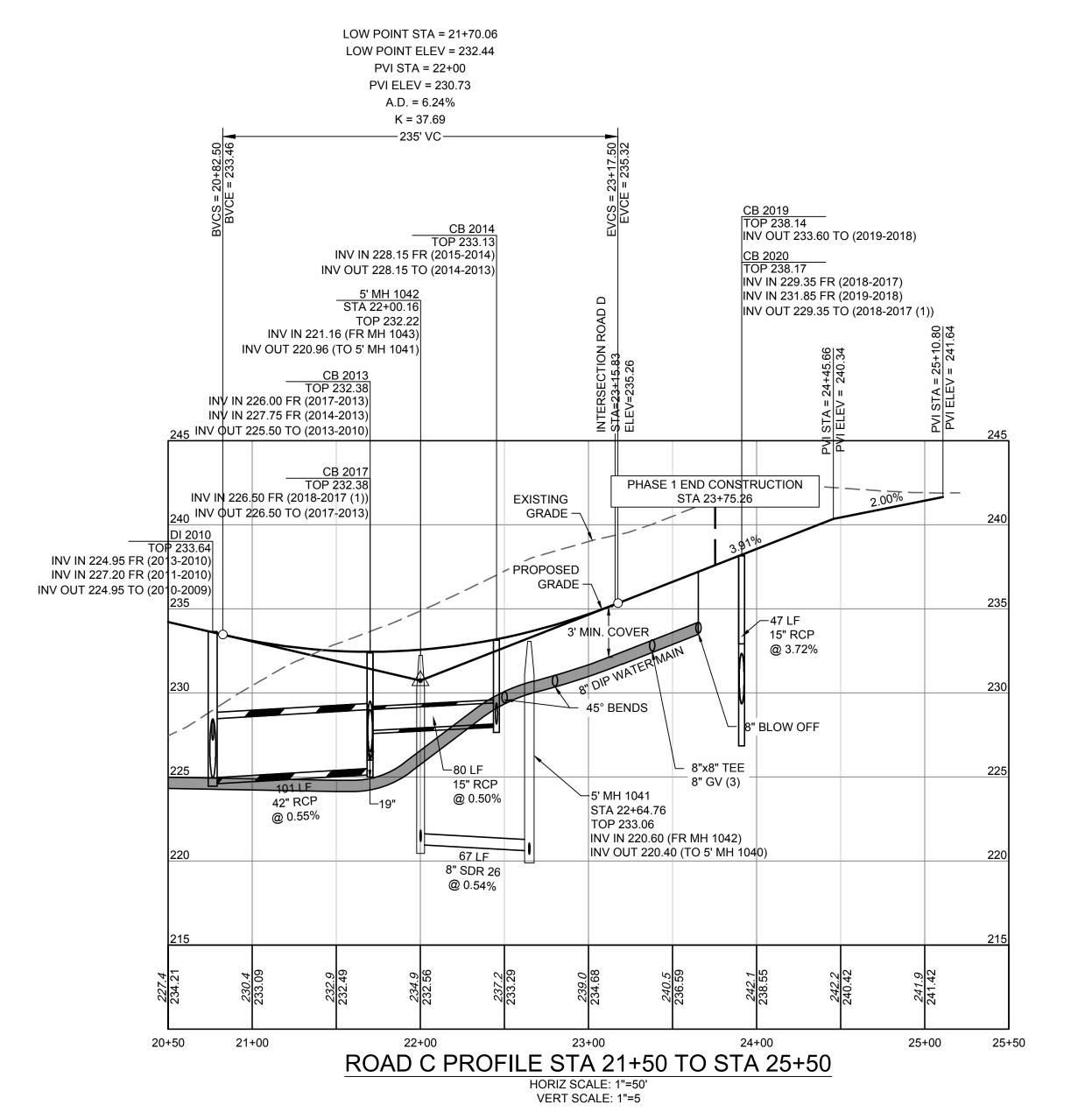
44529

SHEET NO. *C4.3*









The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public

Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the

standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND

	PROPOSED WATER MAIN
 T 	WATER MAIN TEE
<u></u>	FIRE HYDRANT
©	WATER METER
	REDUCER
\otimes	GATE VALVE
$\otimes \otimes$	BLOW OFF ASSEMBLY

SCALE 1"=50'



PROPOSED SEWER MAIN

UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. **GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.**
- 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.



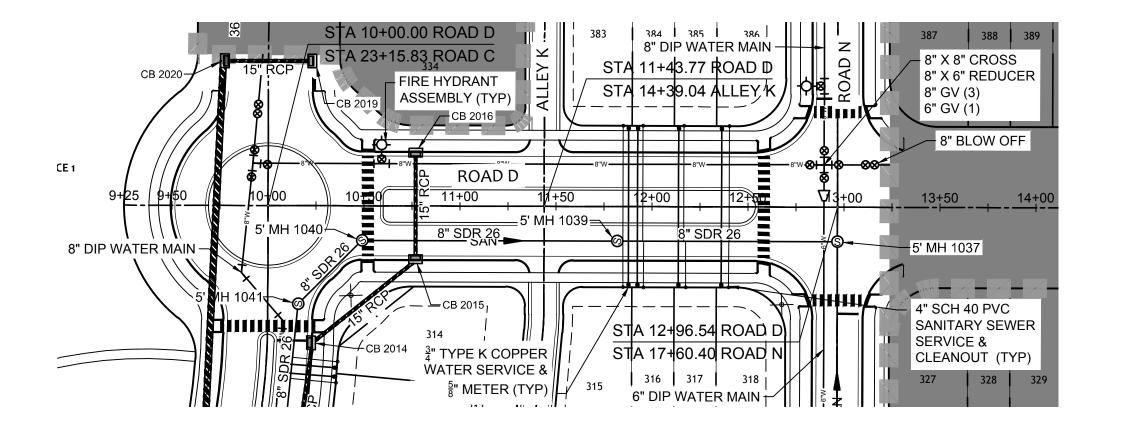
ONSTRUCTION

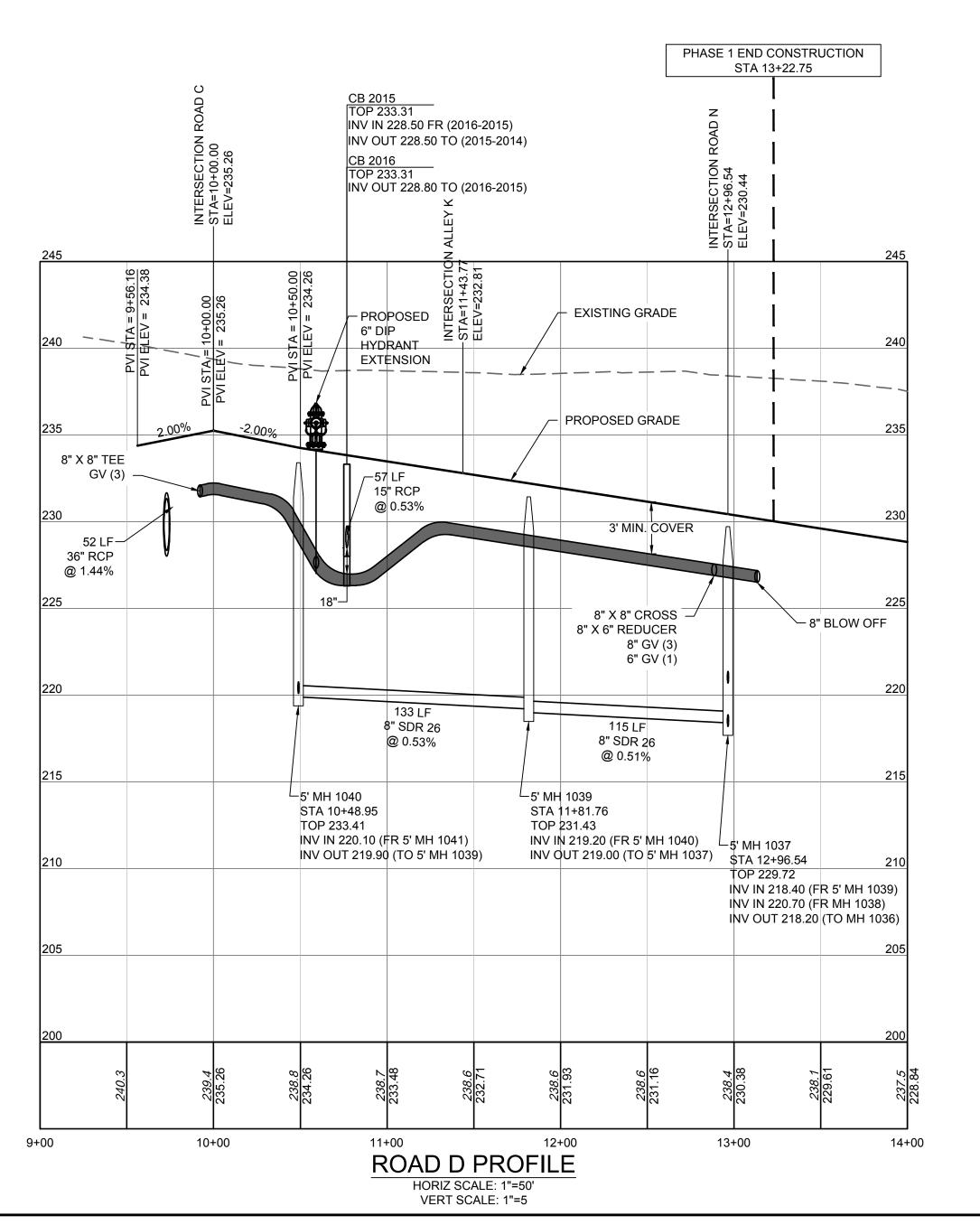
DATE 12/23/2021 DRAWN BY 331

DESIGNED BY 331 CHECKED BY 1. ZACCARDO

SCALE H: 1'' = 50'V: 1" = 5'

JOB NO. 44529 SHEET NO. C5.3





The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

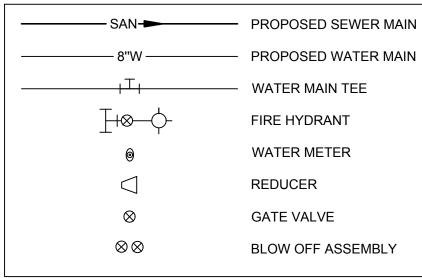
The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # _



UTILITY LEGEND





UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH WAKE COUNTY STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
- 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR



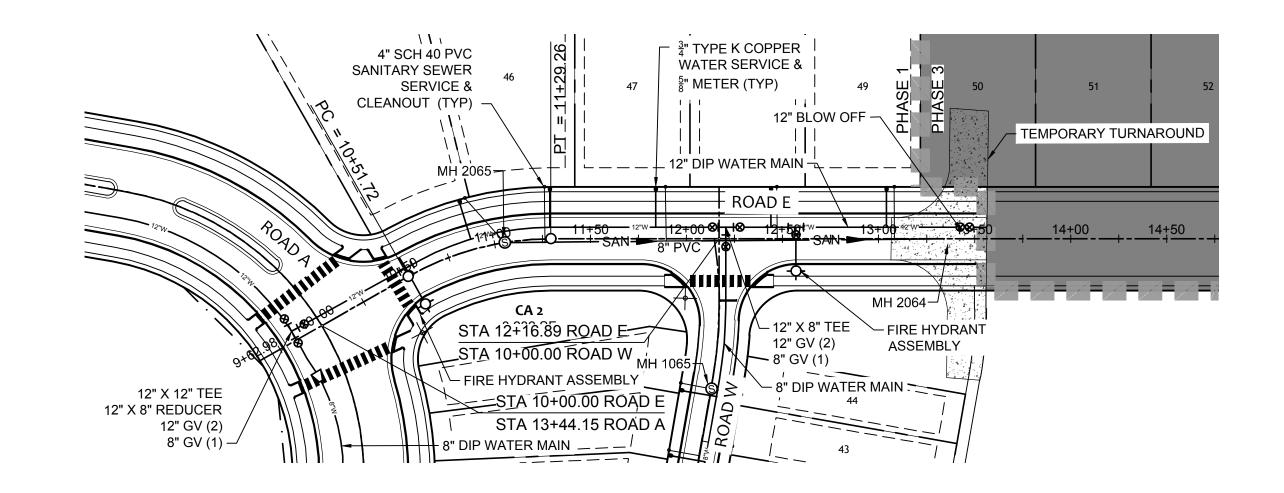
DATE 12/23/2021

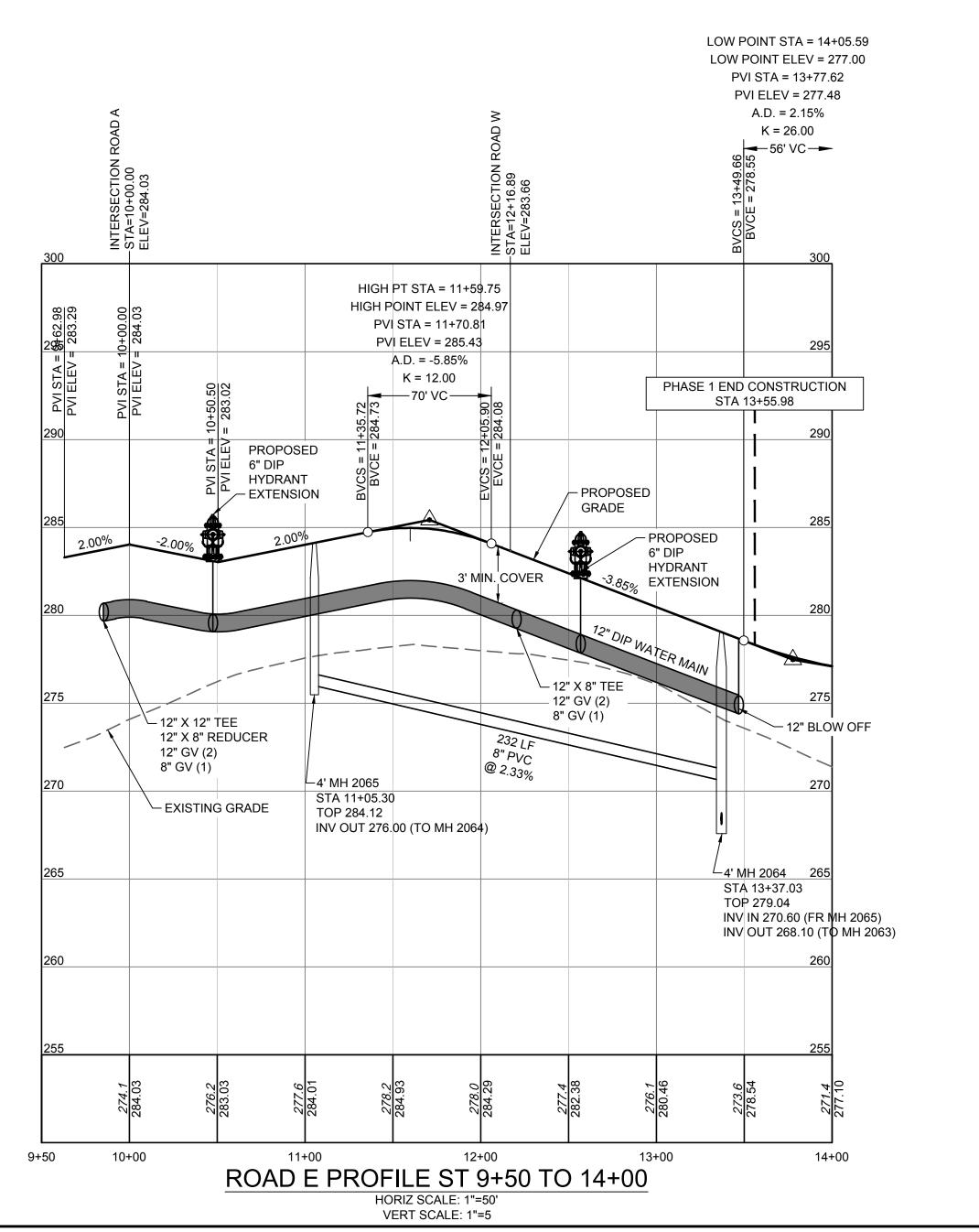
DRAWN BY 331 DESIGNED BY 331

CHECKED BY . ZACCARDO SCALE

H: 1'' = 50'V: 1" = 5'

44529 SHEET NO. C5.4





The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public

Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the

standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #

TOWN CERTIFICATION

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DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND

————SAN- —	PROPOSED SEWER MAIN
8"W	PROPOSED WATER MAIN
 T 	WATER MAIN TEE
<u></u> +∞	FIRE HYDRANT
©	WATER METER
	REDUCER
\otimes	GATE VALVE
$\otimes \otimes$	BLOW OFF ASSEMBLY

SCALE 1"=50'



UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
- 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
- 4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

DATE 12/23/2021 DRAWN BY

CONSTRUCTION

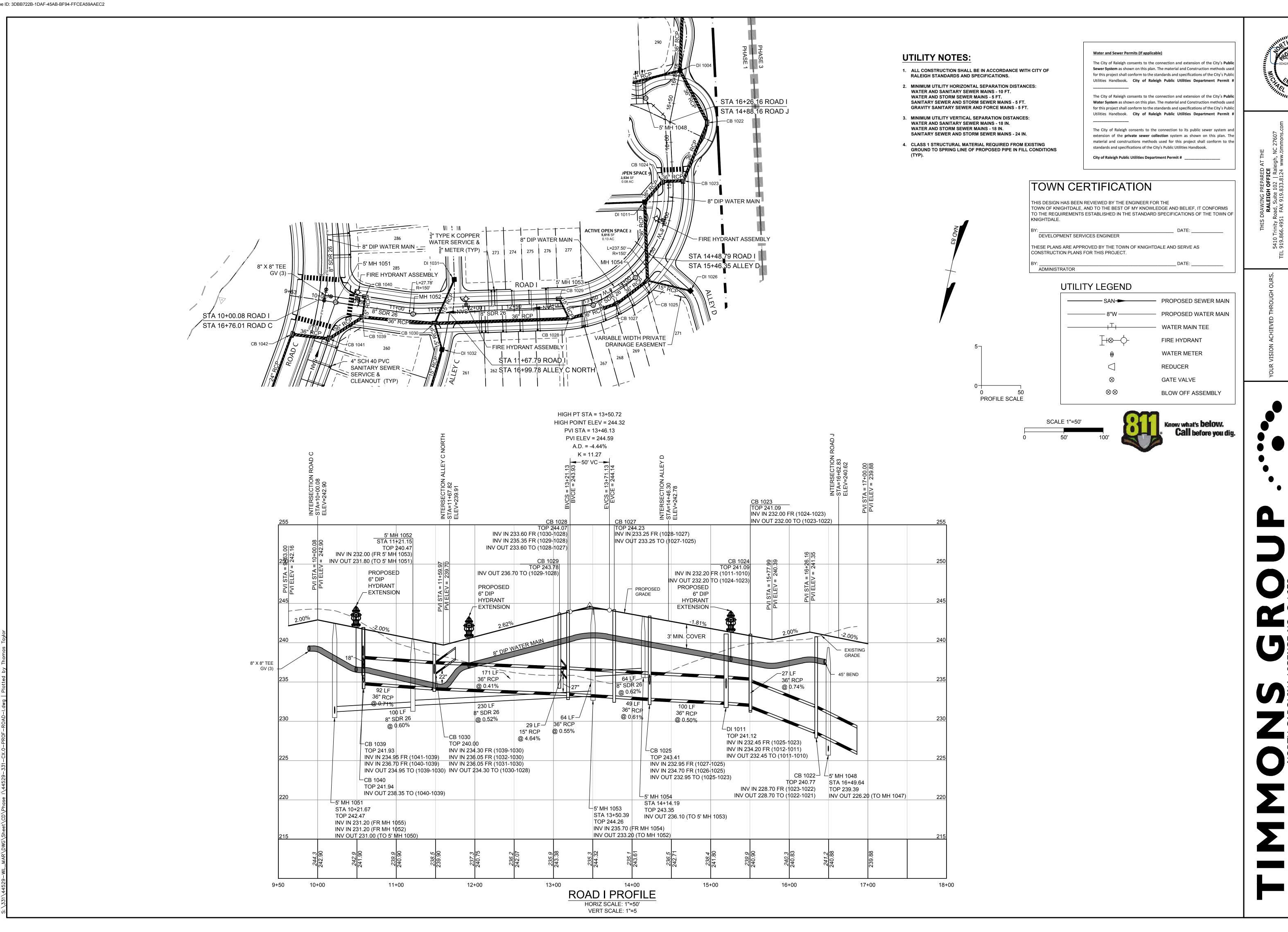
331 DESIGNED BY 331

CHECKED BY . ZACCARDO

SCALE

H: 1'' = 50'V: 1" = 5'

JOB NO. 44529 SHEET NO. C5.5



12/23/2021

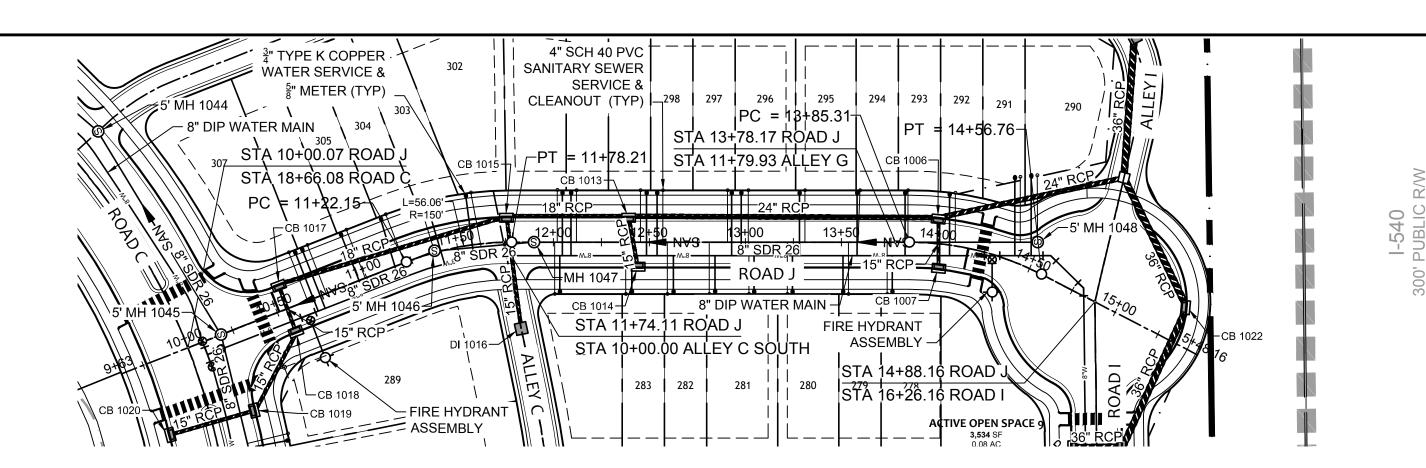
DRAWN BY 331

DESIGNED BY 331 CHECKED BY . ZACCARDO SCALE

H: 1'' = 50'V: 1" = 5'

 Δ

JOB NO. 44529 SHEET NO. C5.6



LOW POINT STA = 12+41.67 TOP 237.7 LOW POINT ELEV = 234.86 INV IN 230.30 FR (1018-1017) PVI STA = 12+56.03 INV OUT 230.05 TO (1017-1015) PVI ELEV = 234.29 A.D. = 4.31% CB 101 TOP 237.7 K = 26.05INV IN 230.50 FR (1019-1018) VCS = 11+99.84 BVCE = 235.20 INV OUT 230.50 TO (1018-1017) LOW POINT STA = 14+20.2β LOW POINT ELEV = 238.74 PVI STA = 14+45.23 CB 1013 TOP 235.06 بر PVI ELEV = 239.42 ه INV IN 228.95 FR (1015-1013) A.D. = 1.79% INV IN 229.20 FR (1014-1013) INV OUT 228.45 TO (1013-1008) K = 27.91CS = 14+70.23 FVGE = 240.54 PVI STA = 14+8 PVI ELEV = VAY S = 14+20.23 VCE = 238.74 PVI STA = 10+00.07
PVI ELEV = 238.48
PVI STA = 10+20.71
PVI ELEV = 238.07 PROPOSED - EXISTING 6" DIP GRADE HYDRANT - PROPOSED EXTENSION + 6" DIP HYDRANT INV OUT 229.85 TO (1014-1013) EXTENSION CB 1015 TOP 235.78 INV IN 229.40 FR (1017-1015) INV IN 229.65 FR (1016-1015) INV OUT 229.40 TO (1015-1013) PROPOSED GRADE -8" X 8" TEE (3) GV — 124 LF 18" RCP └─27 LF 15" RCP @ 0.52% @ 0.74% 262 LF 18" RCP 8" SDR 26 −161 LF 5' MH 1048 @ 0.71% @ 0.50% 119 LF 8" SDR 26 24" RCP STA 14+48.23 8" SDR 26 @ 0.58% @ 0.65% TOP 239.39 @ 0.50% └-5' MH 1047 INV OUT 226.20 (TO MH 1047) STA 11+89.82 └CB 1007 ¹−5′ MH 1045 TOP 235.36 TOP 238.45 STA 10+18.53 - 5' MH 1046 INV IN 224.90 (FR 5' MH 1048) INV OUT 230.10 TO (1007-1006) STA 11+37.85 INV OUT 224.70 (TO 5' MH 1046) TOP 238.12 TOP 236.17 INV IN 225.90 (FR 5' MH 1050) ¹←CB 1006 INV IN 223.60 (FR 5' MH 1046) INV IN 224.40 (FR MH 1047) TOP 238.38 INV OUT 223.40 (TO 5' MH 1044) INV OUT 224.20 (TO 5' MH 1045) INV IN 227.40 FR (1013-1008) INV IN 228.15 FR (1007-1006) INV OUT 227.40 TO (1006-1005)

ROAD J PROFILE

HORIZ SCALE: 1"=50'

VERT SCALE: 1"=5

14+00

15+00

15+50

9+50

10+00

11+00

UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT.

WATER AND SANITARY SEWER MAINS - 18 IN.

WATER AND STORM SEWER MAINS - 18 IN.

- SANITARY SEWER AND STORM SEWER MAINS 5 FT. **GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.** 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
- SANITARY SEWER AND STORM SEWER MAINS 24 IN. 4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS

PROFILE SCALE

Water and Sewer Permits (If applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND PROPOSED SEWER MAIN — PROPOSED WATER MAIN - WATER MAIN TEE FIRE HYDRANT WATER METER REDUCER GATE VALVE **BLOW OFF ASSEMBLY**





DATE 12/23/2021

DRAWN BY 331 331

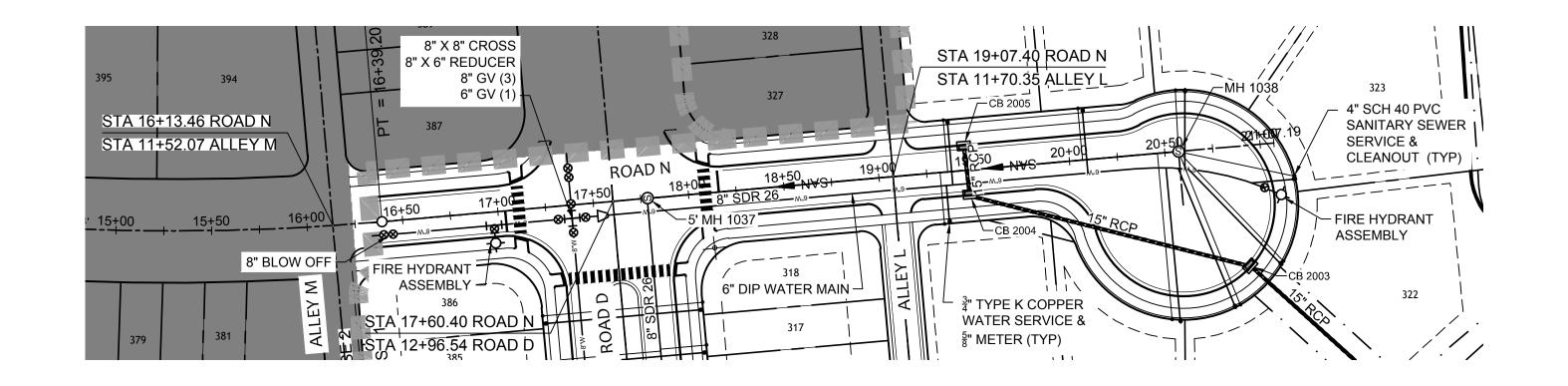
DESIGNED BY CHECKED BY . ZACCARDO

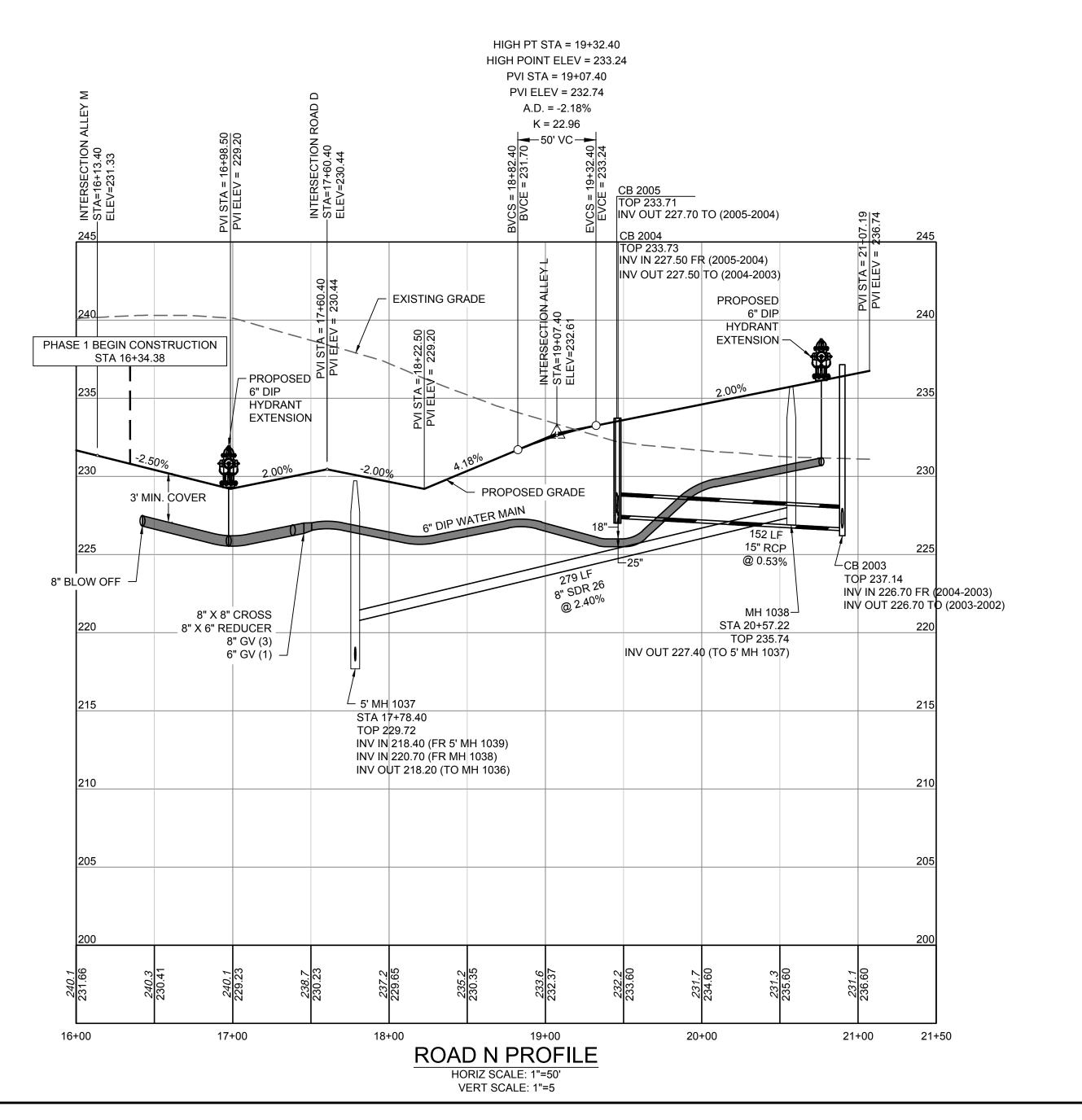
SCALE H: 1'' = 50'V: 1" = 5'

() >

JOB NO. 44529

SHEET NO. C5.7





UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. **GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.**
- MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

Water and Sewer Permits (If applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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City of Raleigh Public Utilities Department Permit #



DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND — PROPOSED SEWER MAIN PROPOSED WATER MAIN WATER MAIN TEE FIRE HYDRANT WATER METER REDUCER GATE VALVE

PROFILE SCALE



BLOW OFF ASSEMBLY



ONSTRUCTION

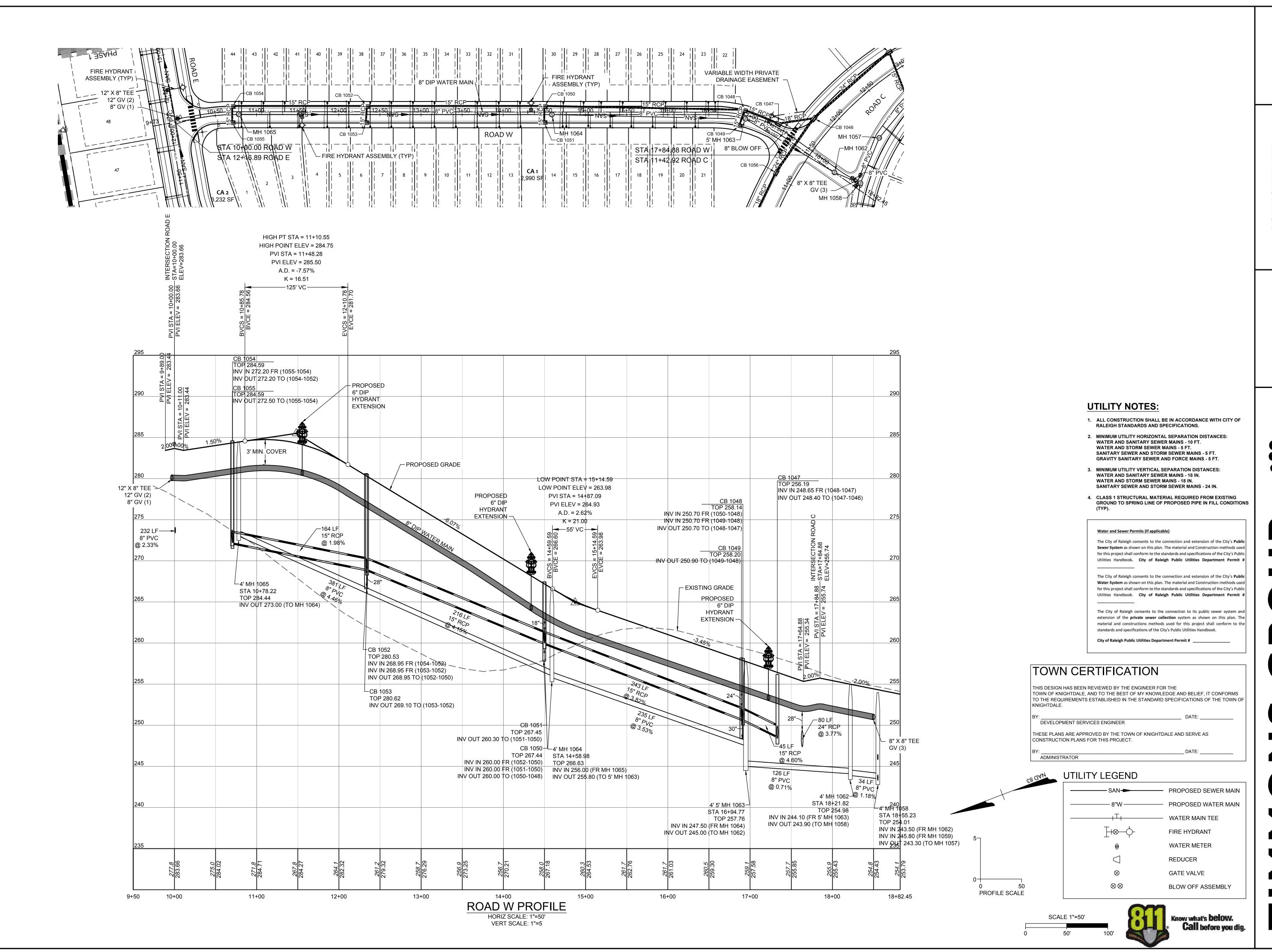
12/23/2021 DRAWN BY 331 DESIGNED BY

331 CHECKED BY . ZACCARDO SCALE H: 1'' = 50'

V: 1" = 5'

SHEET NO.

44529 C5.8





DATE 12/23/2021

DRAWN BY 331

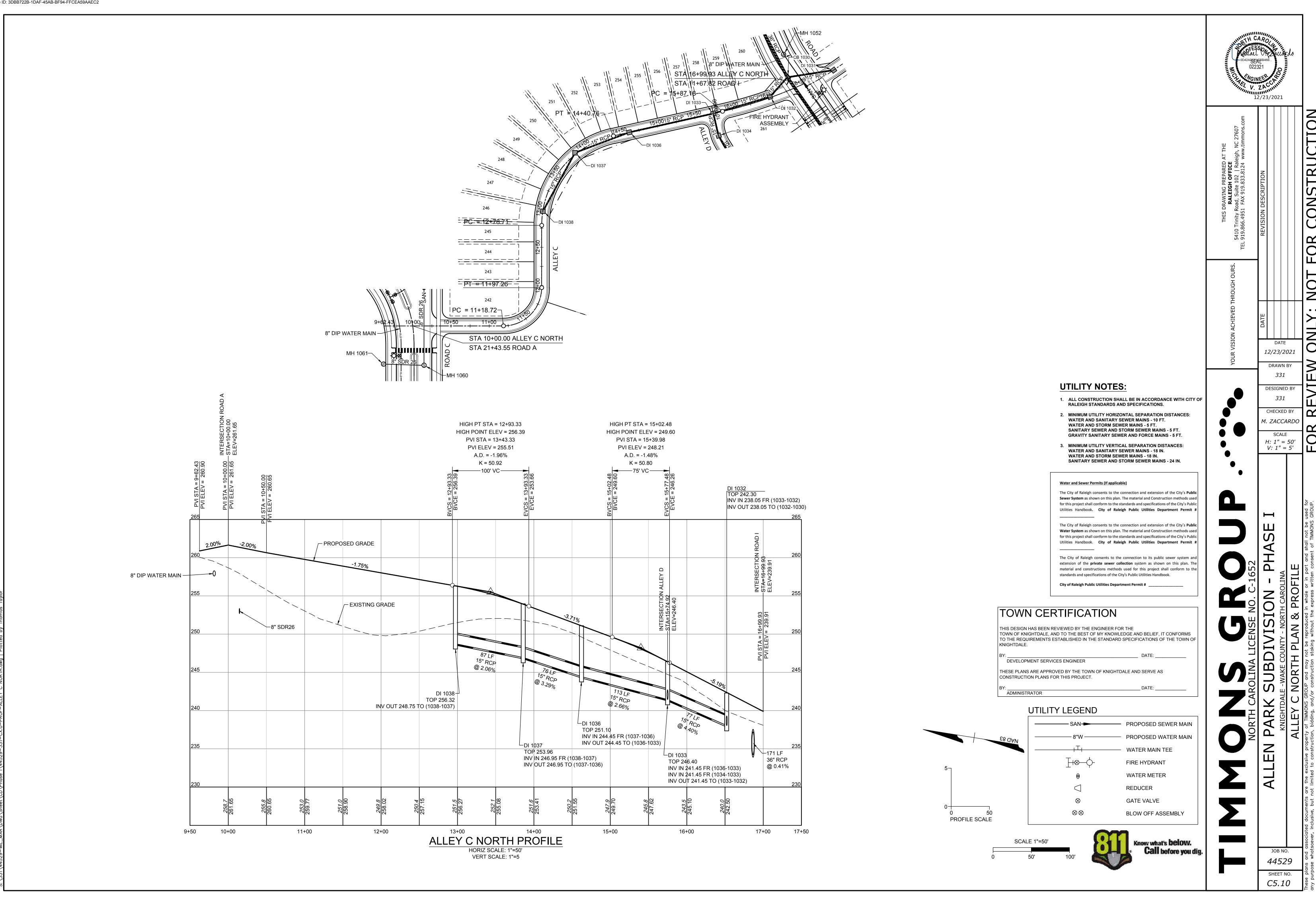
DESIGNED BY 331 CHECKED BY . ZACCARDO

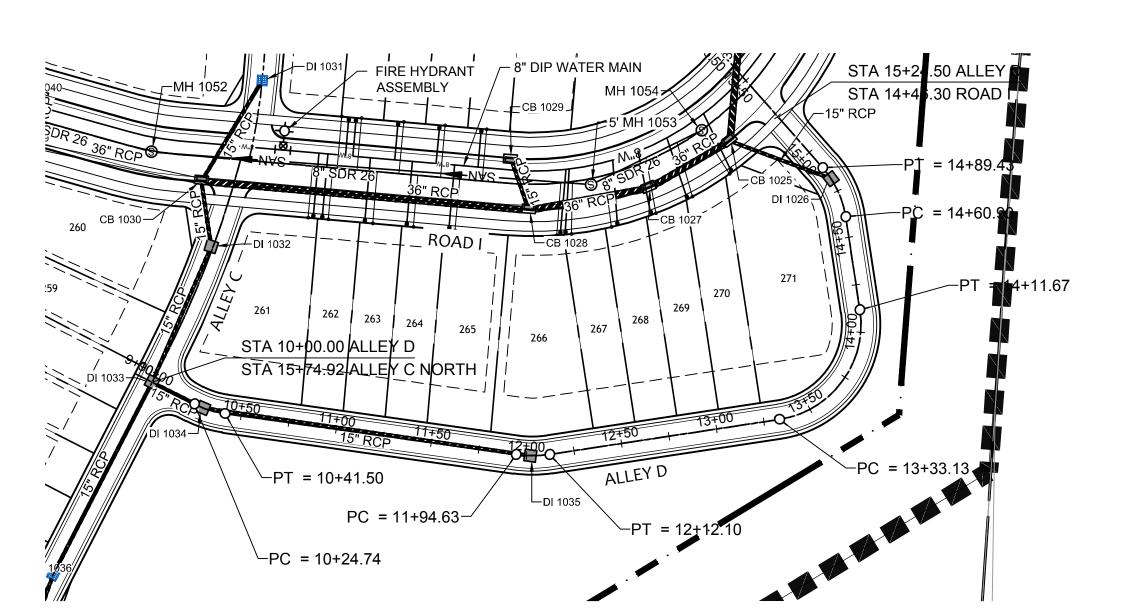
SCALE H: 1'' = 50'

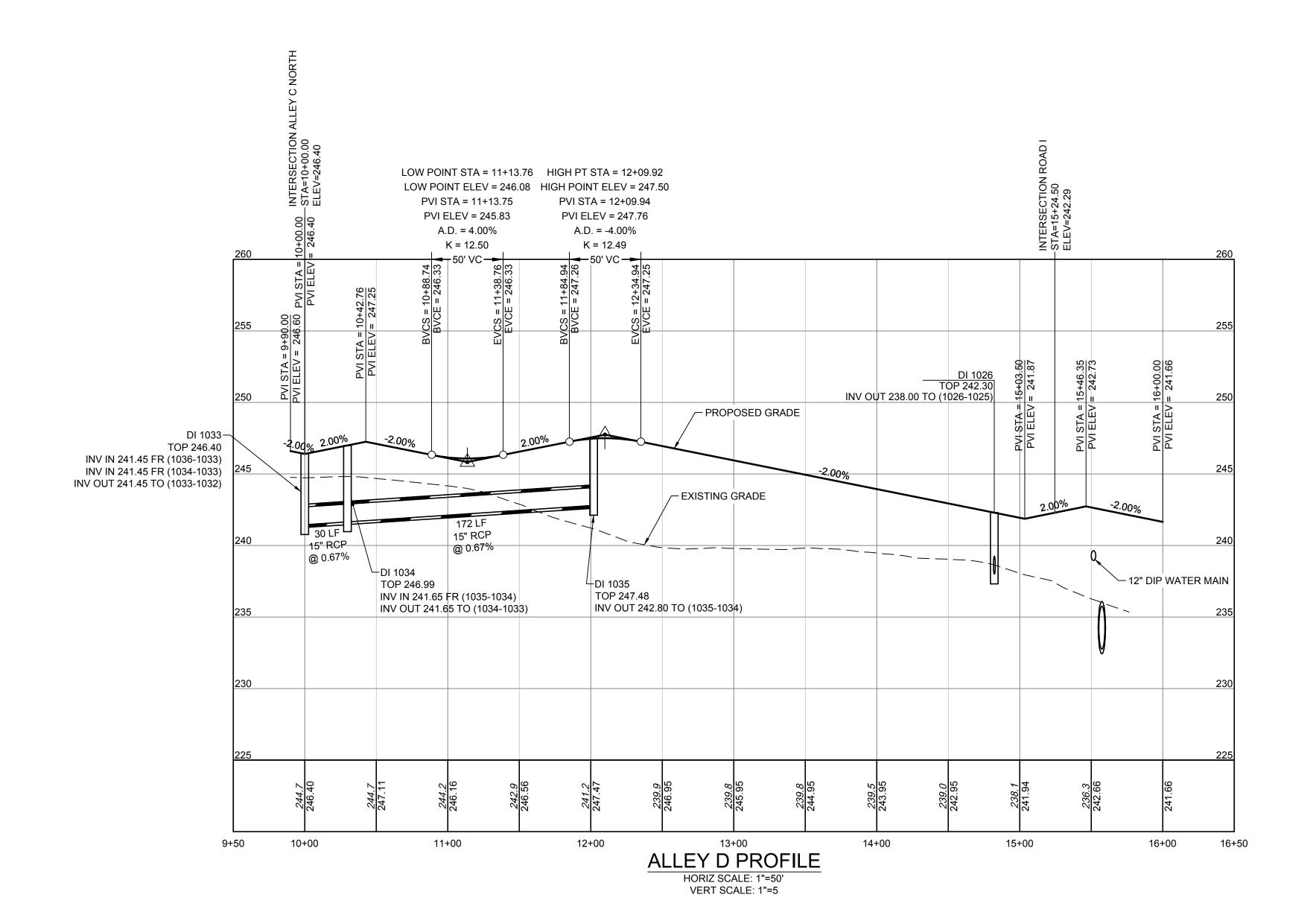
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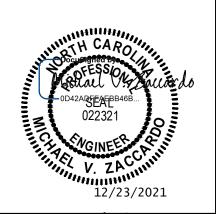
JOB NO.

44529 SHEET NO. C5.9









12/23/2021 DRAWN BY 331

DESIGNED BY 331 CHECKED BY . ZACCARDO

SCALE

V: 1'' = 5'

Utilities Handbook. City of Raleigh Public Utilities Department Permit # The City of Raleigh consents to the connection and extension of the City's Public

Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF

2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT.

SANITARY SEWER AND STORM SEWER MAINS - 5 FT.

GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT. 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:

SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

The City of Raleigh consents to the connection and extension of the City's Public

Sewer System as shown on this plan. The material and Construction methods used

for this project shall conform to the standards and specifications of the City's Public

WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN.

RALEIGH STANDARDS AND SPECIFICATIONS.

WATER AND STORM SEWER MAINS - 5 FT.

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #

UTILITY NOTES:

Water and Sewer Permits (If applicable)





JOB NO. 44529 SHEET NO. C5.11

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT. ADMINISTRATOR UTILITY LEGEND PROPOSED SEWER MAIN - 8"W ----- PROPOSED WATER MAIN - WATER MAIN TEE FIRE HYDRANT WATER METER REDUCER **GATE VALVE BLOW OFF ASSEMBLY**



ONSTRUCTION

DATE 12/23/2021

DRAWN BY 331 DESIGNED BY

331 CHECKED BY 1. ZACCARDO SCALE

H: 1'' = 50'

V: 1'' = 5'

Utilities Handbook. City of Raleigh Public Utilities Department Permit # The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF

2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT.

SANITARY SEWER AND STORM SEWER MAINS - 5 FT.

3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN.

SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL

4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public

GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.

RALEIGH STANDARDS AND SPECIFICATIONS.

WATER AND STORM SEWER MAINS - 5 FT.

WATER AND STORM SEWER MAINS - 18 IN.

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #



3,534 SF 0.08 AC

2+94.70 241.13

12+83.70 = 241.35

PVI STA: PVI ELEV

└─ 8" DIP WATER MAIN

14+00

PVI STA = 12+58.44 PVI ELEV = 240.84

FIRE HYDRANT **ASSEMBLY**

11+50 15" RCP 12+00

ACTIVE OPEN SPACE 2 5,615 SF 0.13 AC

STA 10+00|06 ALLEY G

STA 11+34 21 ALLEY C SOUTH

10+50 11+00

ALLEY G

HIGH PT STA = 11+58.72

HIGH POINT ELEV = 243.04 PVI STA = 11+63.26

PVI ELEV = 243.25

A.D. = -4.15%

K = 10.00

VCS = 11+42.50 BVCE = 242.91 ♣ J VCS = 11+84.02 ♣ EVCE = 242.72

15" RCP

INV IN 232.45 FR (1025-1023) INV IN 234.20 FR (1012-1011) INV OUT 232.45 TO (1011-1010)

12+00

ALLEY G PROFILE

HORIZ SCALE: 1"=50' VERT SCALE: 1"=5

DI 1011- TOP 241.12

@ 2.81%

DI 1012 TOP 242.72 INV OUT 237.50 TO (1012-1011)

- PROPOSED GRADE

EXISTING GRADE

11+00

10+00

9+50

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UTILITY NOTES:

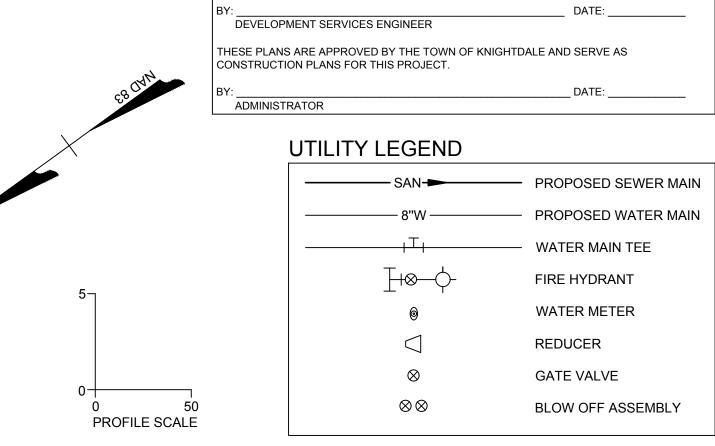
CONDITIONS (TYP).

Water and Sewer Permits (If applicable)

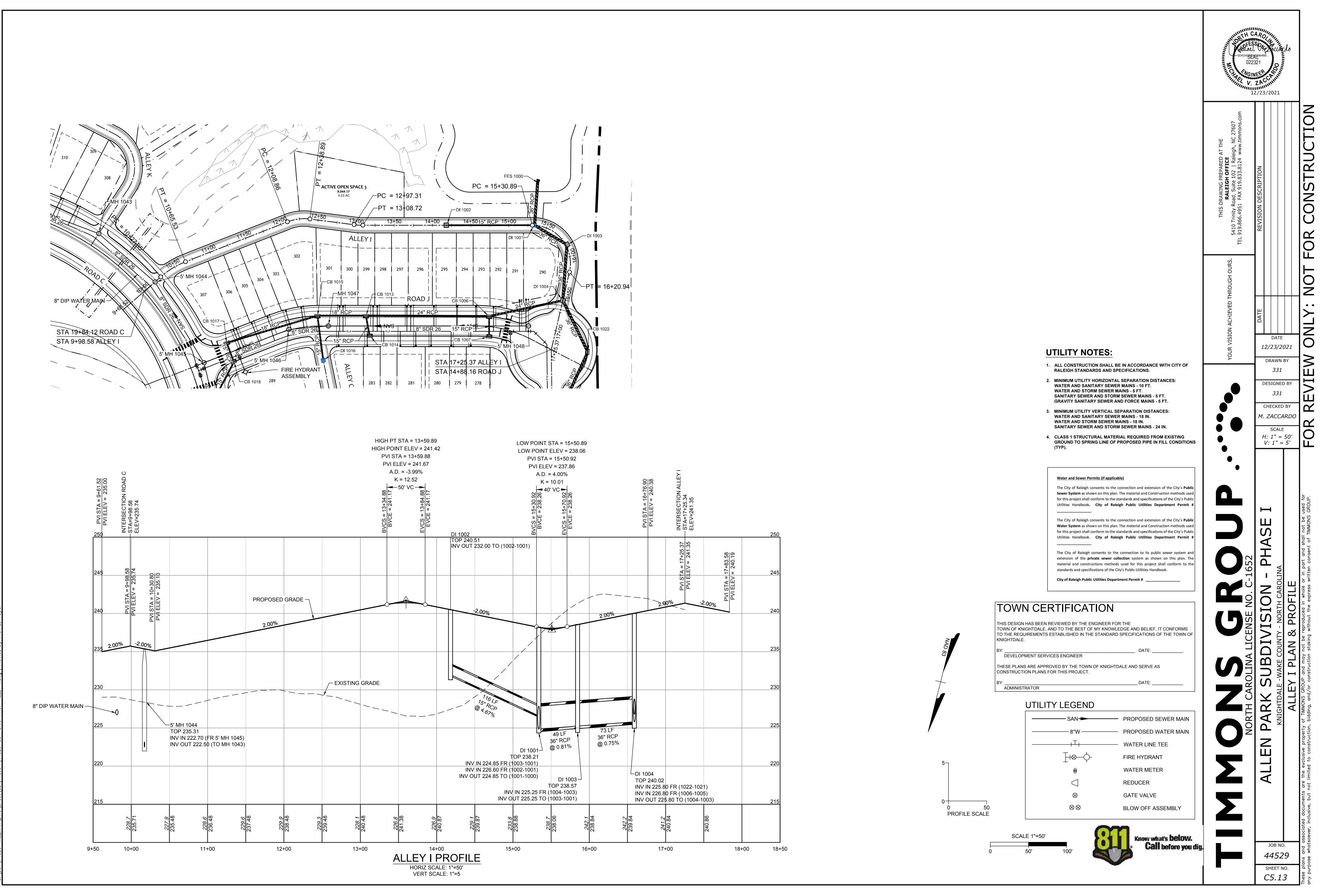
SCALE 1"=50'

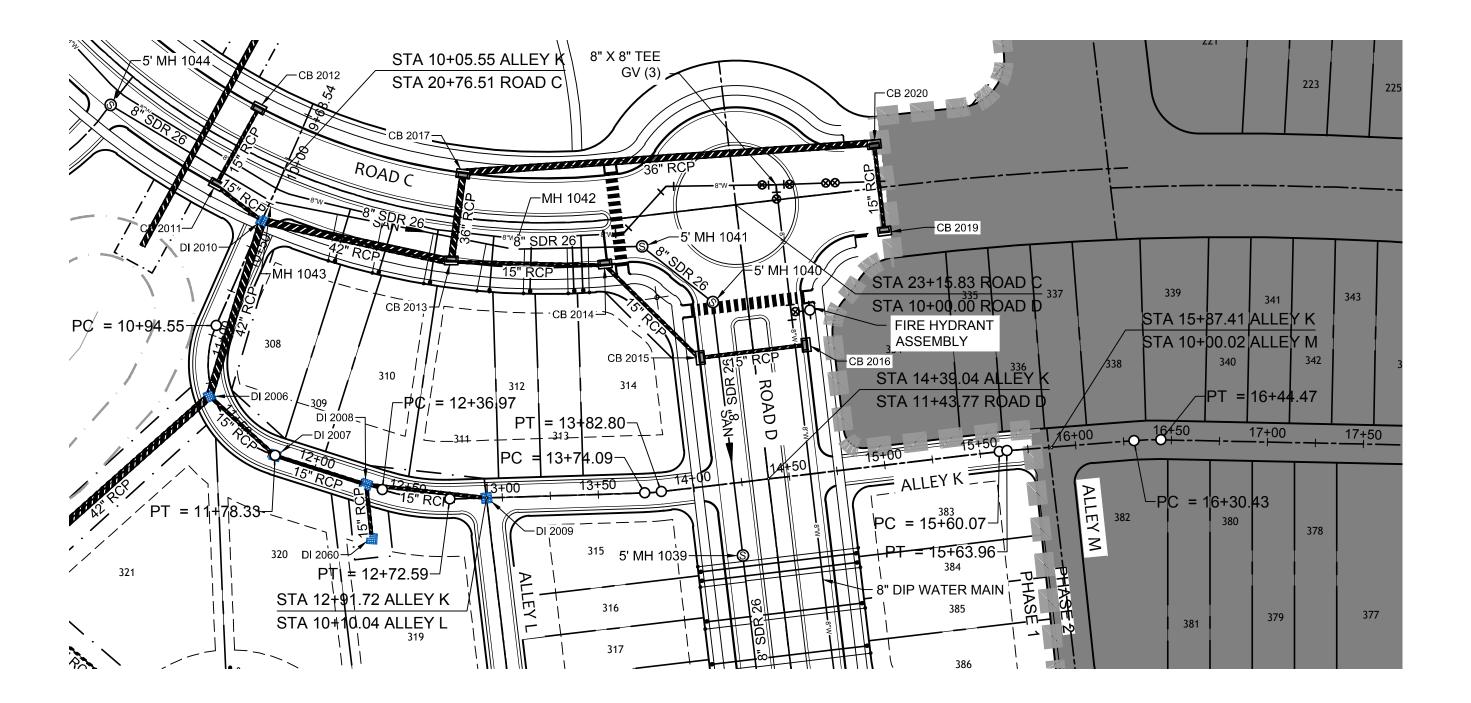


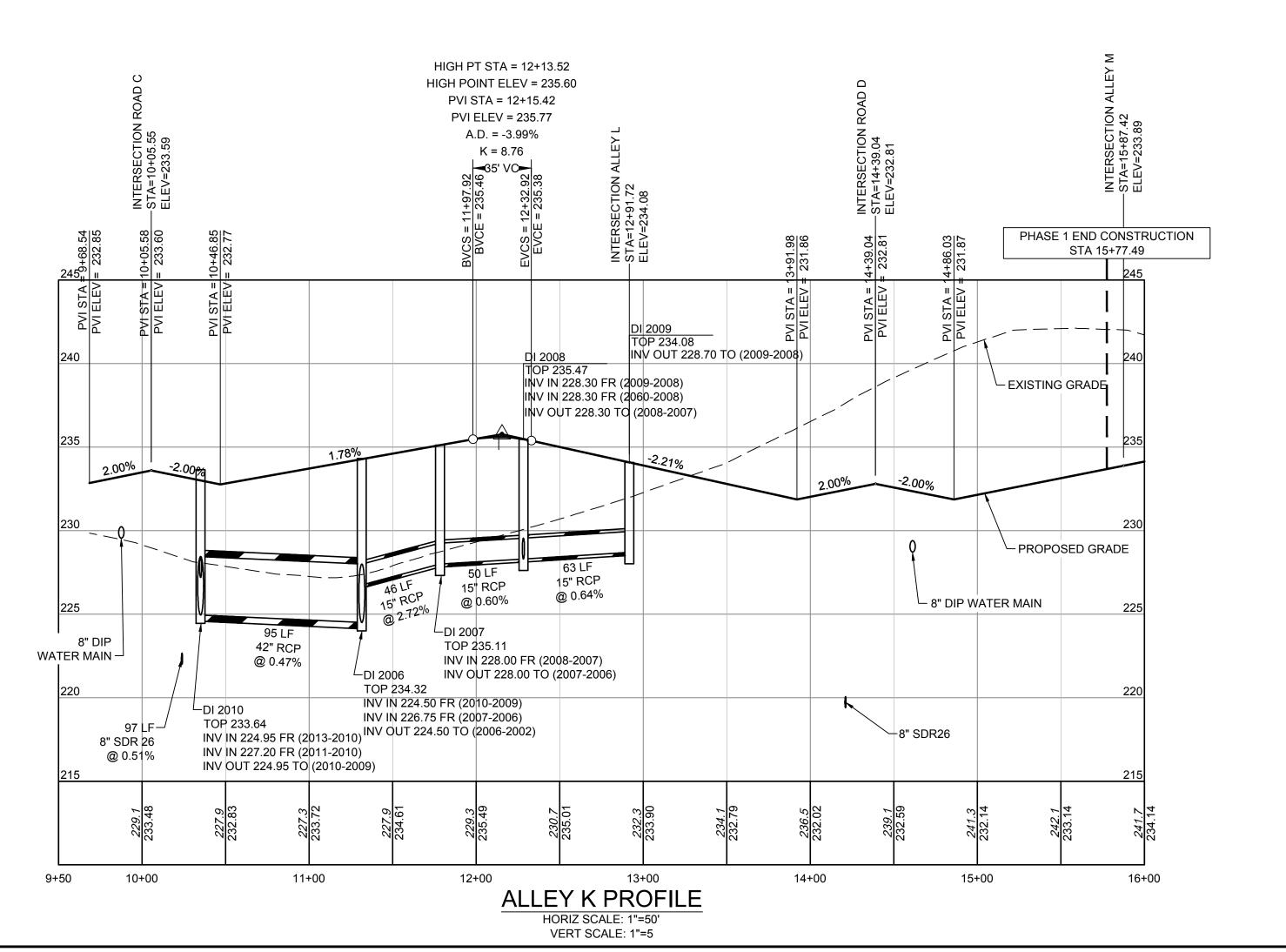




JOB NO. 44529 SHEET NO. C5.12







The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public

Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

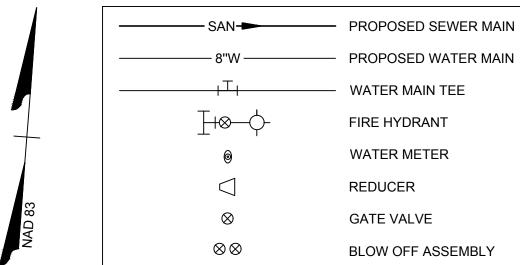
TOWN CERTIFICATION

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DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND





UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. **GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.**
- 3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
- 4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM **EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN** FILL CONDITIONS (TYP).

ONSTRUCTION

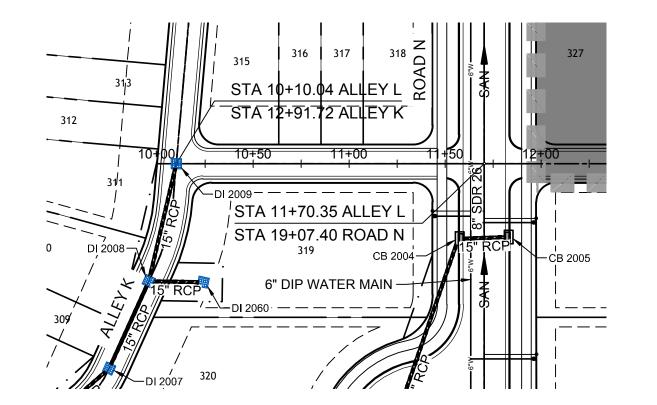
DATE 12/23/2021 DRAWN BY 331

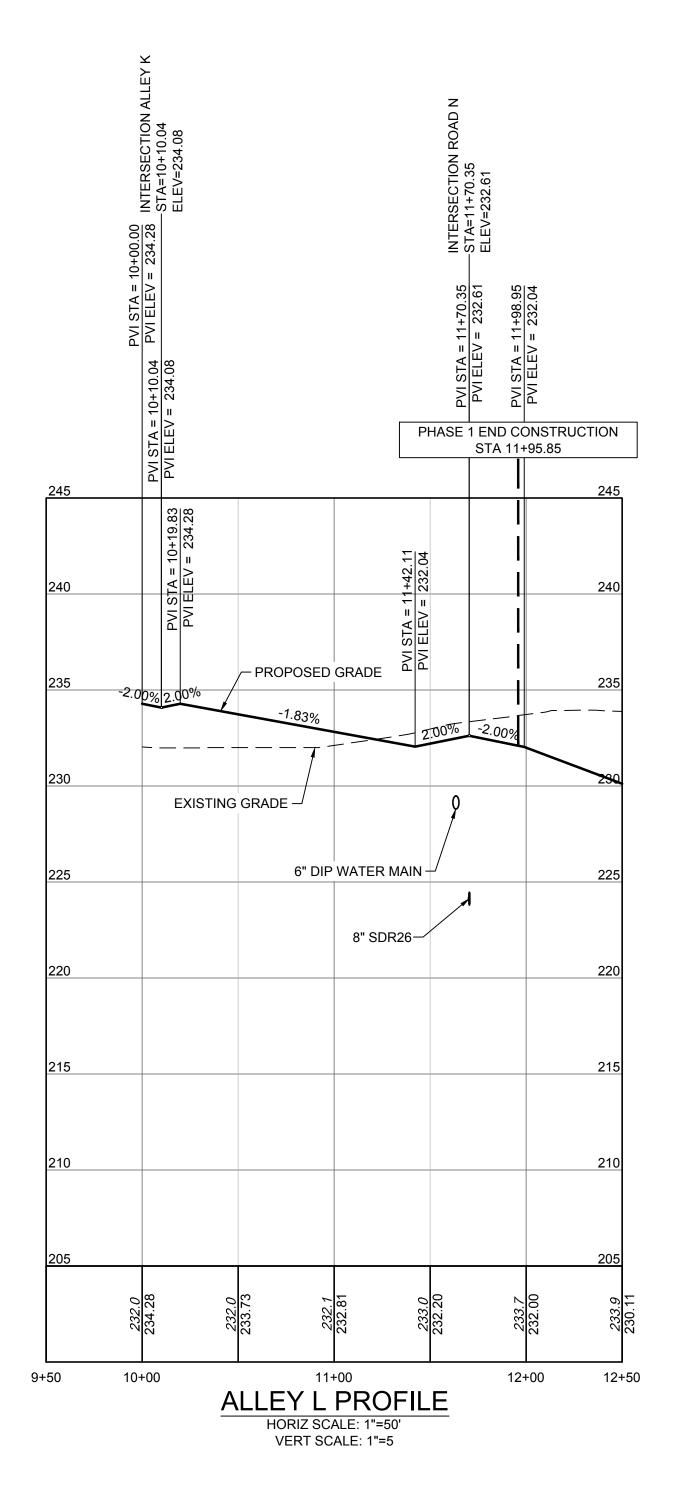
DESIGNED BY 331 CHECKED BY . ZACCARDO

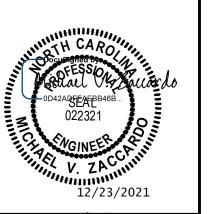
SCALE H: 1'' = 50'

V: 1" = 5'

JOB NO. 44529 SHEET NO. C5.14







CONSTRUCTION

DATE 12/23/2021

DRAWN BY 331 DESIGNED BY

331 CHECKED BY . ZACCARDO

SCALE

V: 1'' = 5'

Water and Sewer Permits (If applicable)

UTILITY NOTES:

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF

2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT.

SANITARY SEWER AND STORM SEWER MAINS - 5 FT. **GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.**

SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN.

RALEIGH STANDARDS AND SPECIFICATIONS.

WATER AND STORM SEWER MAINS - 5 FT.

WATER AND STORM SEWER MAINS - 18 IN.

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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City of Raleigh Public Utilities Department Permit #

TOWN CERTIFICATION

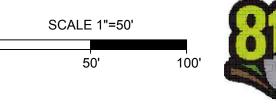
THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF

DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

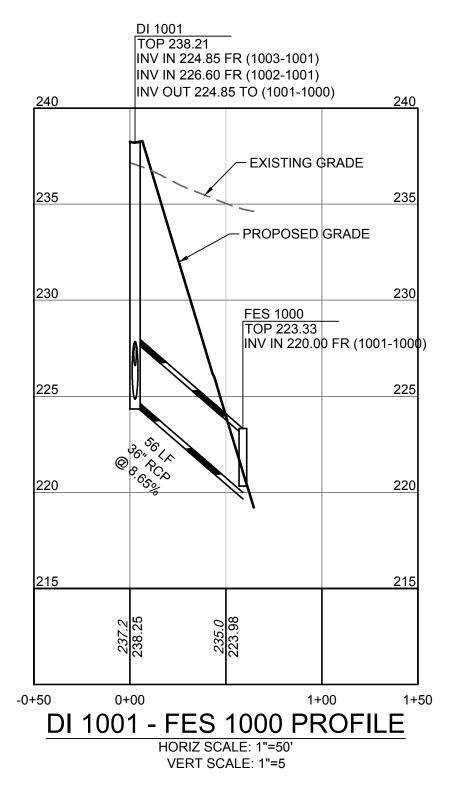
- WATER LINE TEE FIRE HYDRANT WATER METER REDUCER GATE VALVE PROFILE SCALE





UTILITY LEGEND PROPOSED SEWER LINE PROPOSED WATER LINE **BLOWOFF ASSEMBLY**

> JOB NO. 44529 SHEET NO. C5.15



EXISTING GRADE

CULVERT 2 PROFILE

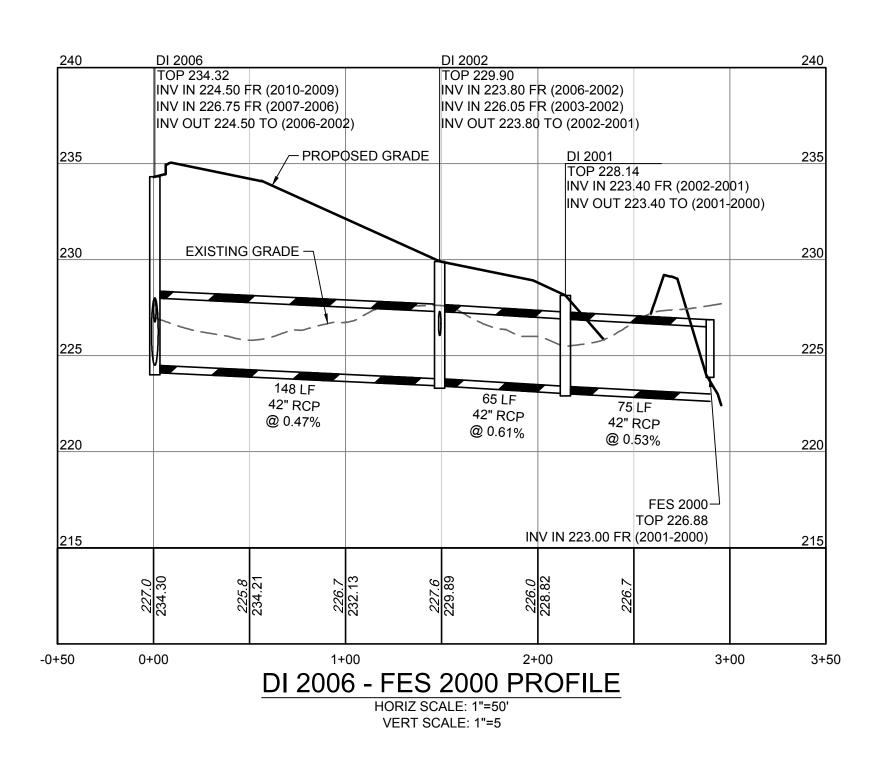
HORIZ SCALE: 1"=50'

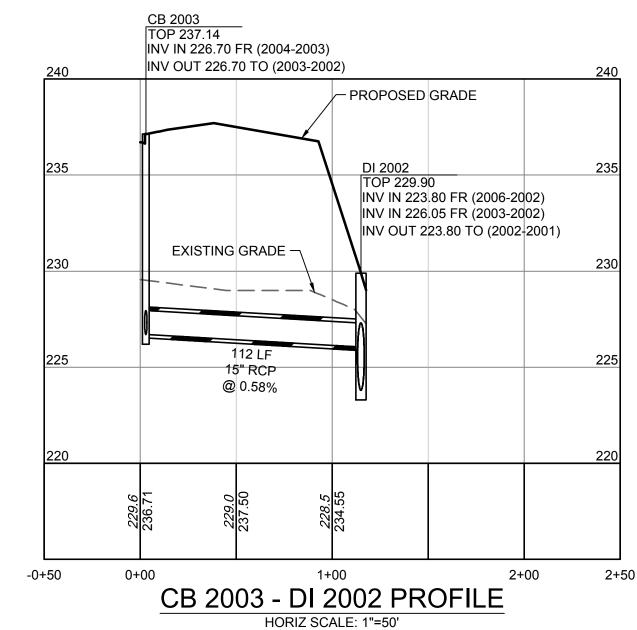
VERT SCALE: 1"=5

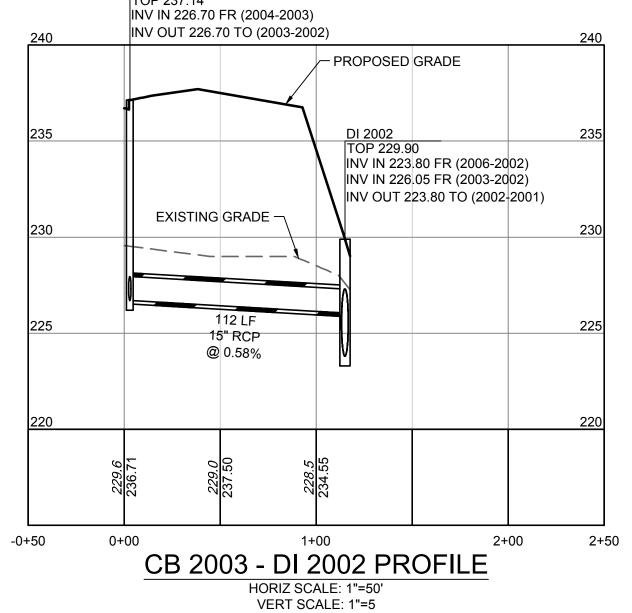
-0+50

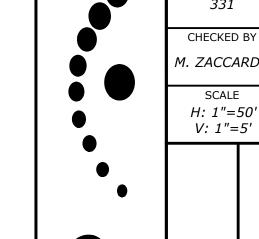
- PROPOSED GRADE

8" WATER MAIN









SCALE H: 1"=50' V: 1"=5'

DATE

12/23/2021

DRAWN BY 331

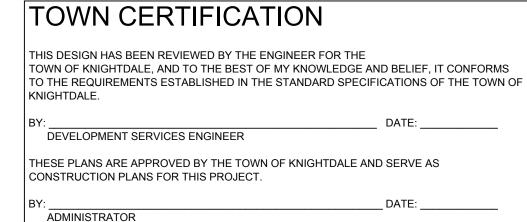
DESIGNED BY 331

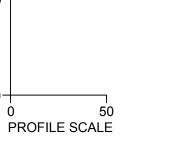
1. ZACCARDO

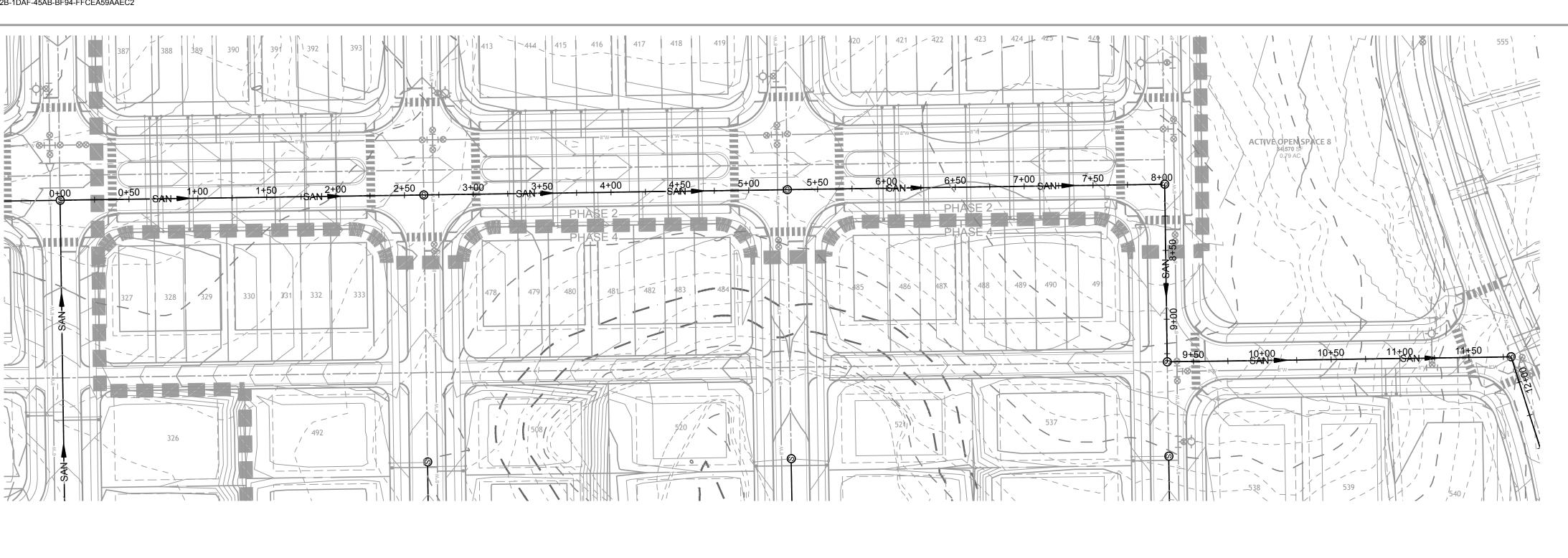
CONSTRUCTION

JOB NO. 44529 SHEET NO. C5.16

KNIGHTDALE.







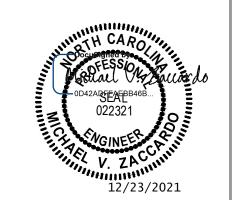
MH 1035 STA: 5+28.00 TOP 221.57

INV IN 214.20 (FR MH 1036) INV OUT 214.00 (TO MH 1034)

SSWR OUTFALL PROFILE STA 0+00 TO STA 12+00

HORIZ SCALE: 1"=50"
VERT SCALE: 1"=5

274 LF 8" SDR 26



UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
- 2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT.

GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.

3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

Water and Sewer Permits (If applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit #

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City of Raleigh Public Utilities Department Permit #

TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF

DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS

ADMINISTRATOR

KNIGHTDALE.

CONSTRUCTION PLANS FOR THIS PROJECT.

UTILITY LEGEND

STA 11+80.62

TOP 217.97 INV IN 204.40 (FR MH 1033)

INV IN 204.40 (FR MH 1032) INV OUT 204.20 (TO MH 1030) 230

MH 1033 STA: 9+31.00

INV IN 208.60 (FR MH 1034) INV OUT 208.40 (TO MH 1031)

8" SDR 26 @ 1.60%

11+00

12+00

10+00

TOP 222.60

MH 1034 STA: 8+02.00 TOP 222.38

INV IN 210.40 (FR MH 1035) INV OUT 210.20 (TO MH 1033)

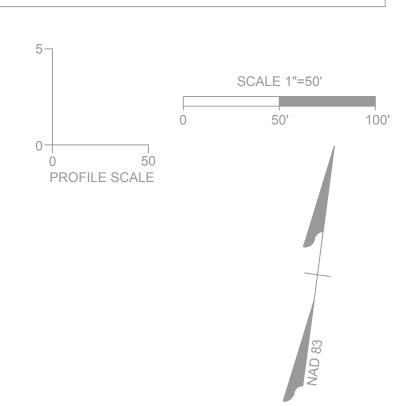
> 129 LF 8" SDR 26

@ 1.24%

9+00

———— SAN-———	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
 T	WATER LINE TEE
<u></u>	FIRE HYDRANT
©	WATER METER
	REDUCER
\otimes	GATE VALVE
$\otimes \otimes$	BLOW OFF ASSEMBLY





0+00

5' MH 1037 STA: 0+00.00

TOP 229.72

INV IN 218.40 (FR 5' MH 1039) INV IN 220.70 (FR MH 1038) INV OUT 218.20 (TO MH 1036)

264 LF 8" SDR 26

1+00

2+00

MH 1036 STA: 2+64.00 TOP 225.63

INV IN 216 80 (FR 5' MH 1037) INV OUT 216.60 (TO MH 1035)

3+00

8" SDR 26 @ 0.91%

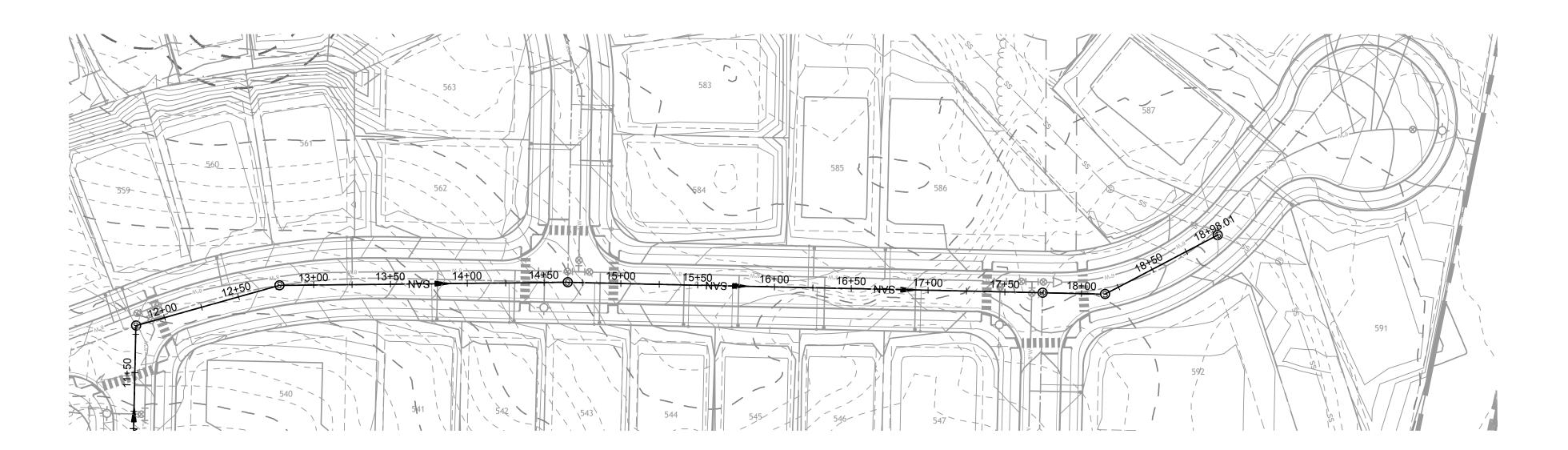
12/23/2021 DRAWN BY

> 331 DESIGNED BY 331 CHECKED BY M. ZACCARDO

SCALE

H: 1"=50' V: 1"=5'

44529 SHEET NO. C5.17



MH 1031 STA: 11+80.62 INSIDE DROP 6' DOGH<u>OUSE MH 1000</u> STA 18+98.0' TOP 217.97 INV IN 204.40 (FR MH 1033) TOP 208.98 INV IN 204.40 (FR MH 1032) INV IN 193.10 (FR MH 1002) INV OUT 204.20 (TO MH 1030) INV IN 195.60 (FR MH 1001) TOP 217.57 TOP 210.46 INV IN 202.80 (FR MH 1031) INV IN 193.90 (FR MH 1003) INV OUT 202.60 (TO MH 1015) INV OUT 193.70 (TO INSIDE DROP 6' DOGHOUSE MH 1000) MH 1015 STA: 14+65.31 TOP 211.37 MH 1003 STA 17+74.57 INV IN 196.10 (FR MH 1016) INV IN 198.40 (FR MH 1030) TOP 210.51 INV IN 196.60 (FR MH 1004) INV IN 194.30 (FR MH 1015) INV OUT 195.90 (TO MH 1003) INV OUT 194.10 (TO MH 1002) 8" SDR 26 @ 1.45% 8" SDR 26 @ 2.24% 309 LF 8" SDR 26 @ 0.52% 41 LF 83 LF 8" SDR 26 @ 0.72% 8" SDR 26 @ 0.5**¢**%

SSWR OUTFALL PROFILE STA 11+50 TO STA 19+50
HORIZ SCALE: 1"=50"

VERT SCALE: 1"=5

18+00

19+00

19+50



UTILITY NOTES:

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GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.

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WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

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City of Raleigh Public Utilities Department Permit # _

TOWN CERTIFICATION

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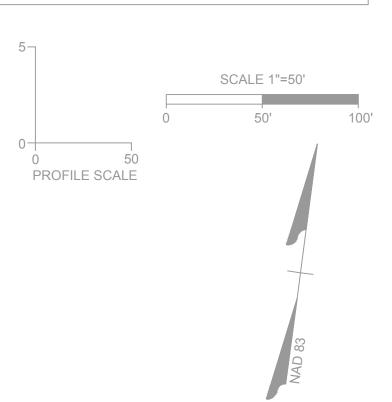
DEVELOPMENT SERVICES ENGINEER THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS

CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

UTILITY LEGEND

· · · · · · · · · · · · · · · · · · ·			
———SAN-——	PROPOSED SEWER LINE		
8"W ———	PROPOSED WATER LINE		
- T 	WATER LINE TEE		
<u></u>	FIRE HYDRANT		
©	WATER METER		
	REDUCER		
\otimes	GATE VALVE		
$\otimes \otimes$	BLOW OFF ASSEMBLY		
I .			





RAWING PREPARED / RALEIGH OFFICE pad, Suite 102 | Rale FAX 919.833.8124 v

12/23/2021

331 DESIGNED BY 331 CHECKED BY M. ZACCARDO

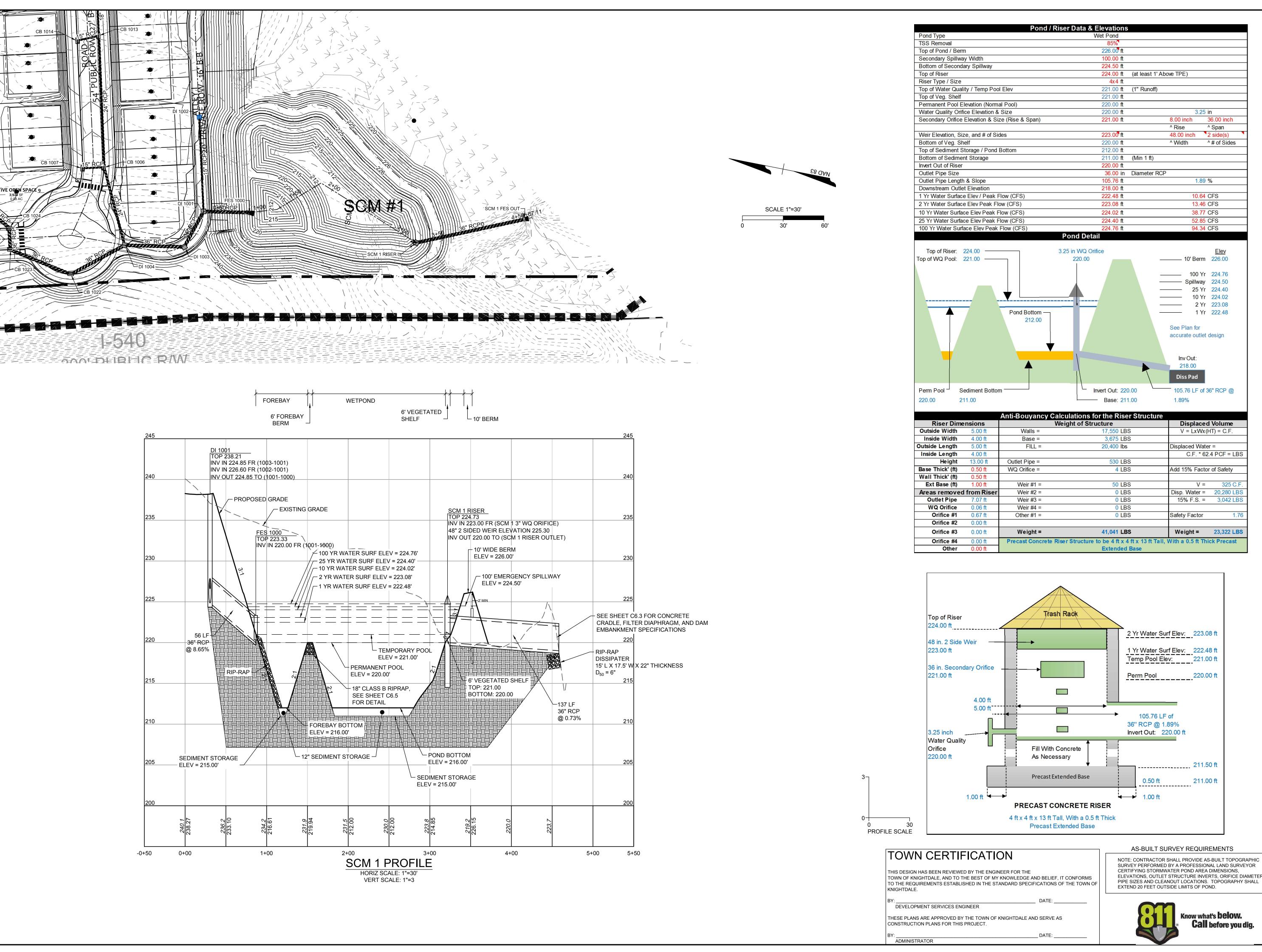
SCALE H: 1"=50' V: 1"=5'

44529 SHEET NO. C5.18

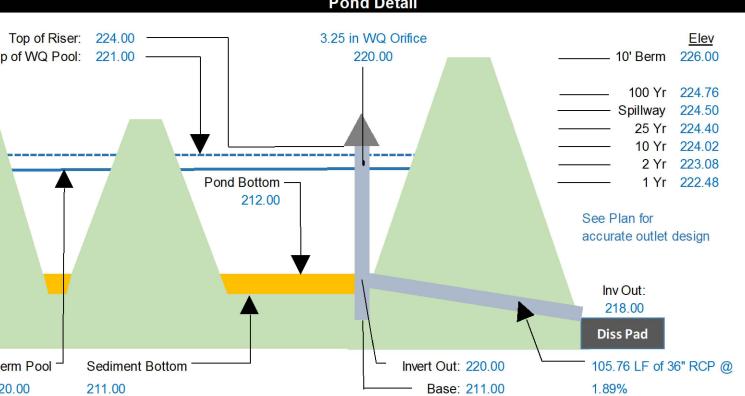
12+00

13+00

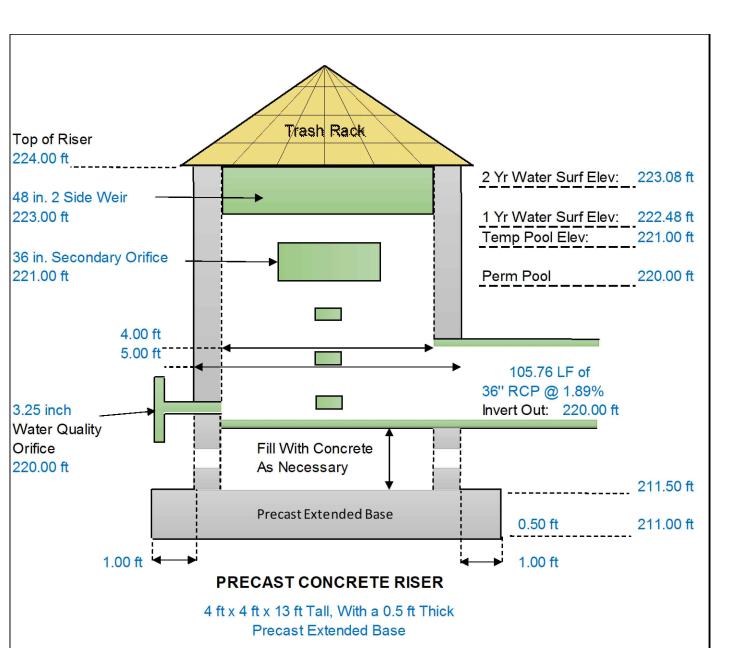
11+50



224.00 ft (at least 1' Above TPE) 3.25 in 8.00 inch 36.00 inch 2 side(s) 48.00 inch 1.89 % 10.64 CFS 13.46 CFS 38.77 CFS 52.85 CFS 94.34 CFS

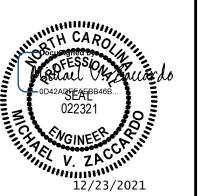


Anti-Bouyancy Calculations for the Riser Structure							
Riser Dimensions		Weight of Structure		Displaced	Displaced Volume		
Outside Width 5.00 ft		Walls =	17,550 LBS	V = LxWx(HT) = C.F.			
Inside Width	4.00 ft	Base =	3,675 LBS				
Outside Length 5.00 ft		FILL =	20,400 lbs	Displaced Wate	Displaced Water =		
Inside Length 4.00 ft				C.F. * 62.4 PCF = LBS			
Height	13.00 ft	Outlet Pipe =	530 LBS				
Base Thick' (ft) 0.50 ft		WQ Orifice =	4 LBS	Add 15% Factor of Safety			
Wall Thick' (ft)	0.50 ft						
Ext Base (ft)	1.00 ft	Weir #1 =	50 LBS	V =	325 C.F.		
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	20,280 LBS		
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	3,042 LBS		
WQ Orifice	0.06 ft	Weir #4 =	0 LBS				
Orifice #1	0.67 ft	Other #1 =	0 LBS	Safety Factor	1.76		
Orifice #2	0.00 ft						
Orifice #3	0.00 ft	Weight =	41,041 LBS	Weight =	23,322 LBS		
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 4 ft x 4 ft x 13 ft Tall, With a 0.5 ft Thick Precast					



ELEVATIONS, OUTLET STRUCTURE INVERTS, ORIFICE DIAMETER, PIPE SIZES AND CLEANOUT LOCATIONS. TOPOGRAPHY SHALL EXTEND 20 FEET OUTSIDE LIMITS OF POND. Know what's **below**.

Call before you dig.



ONSTRUCTION

12/23/2021

DRAWN BY

331

DESIGNED BY

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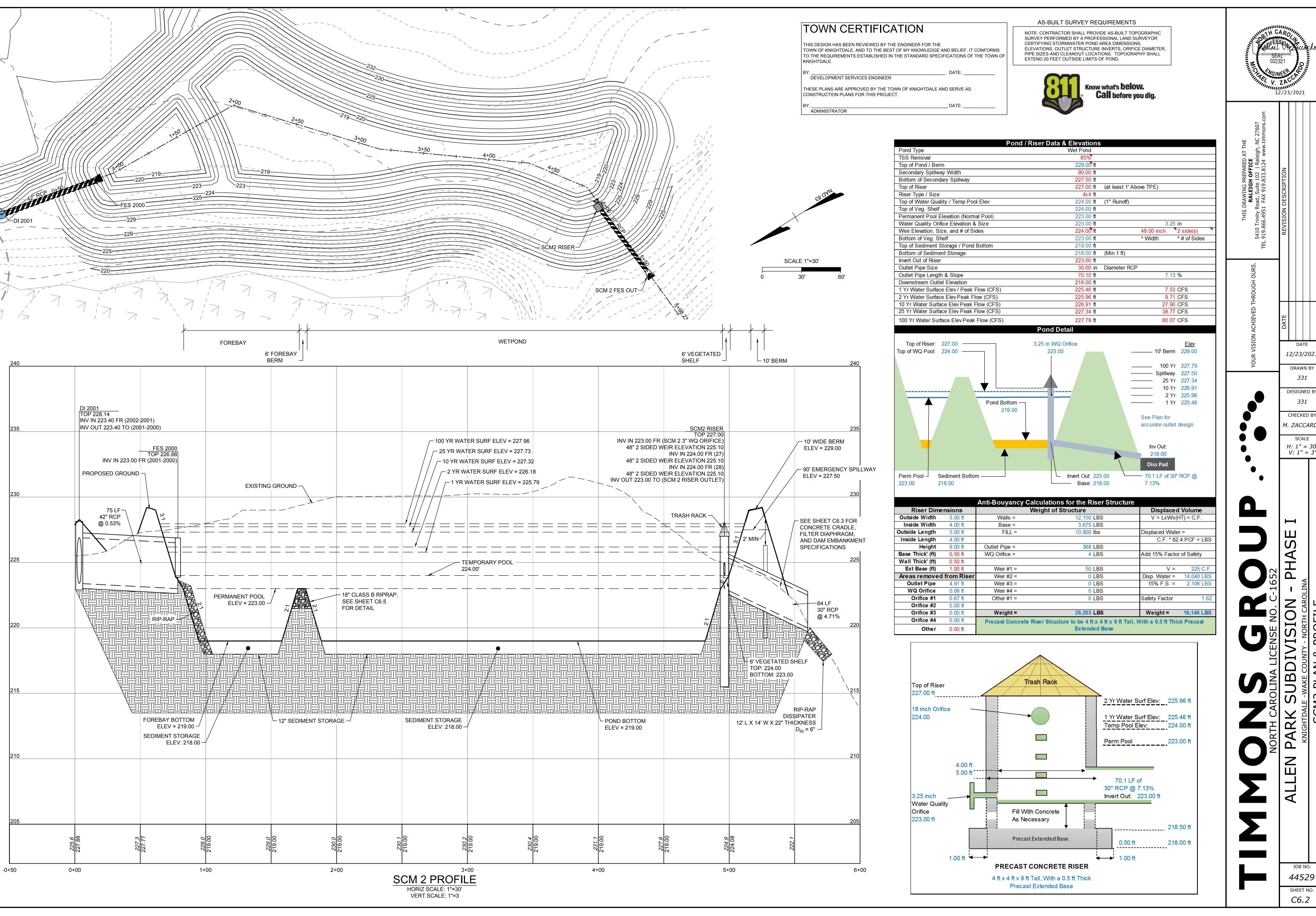
CHECKED BY . ZACCARDO

SCALE

H: 1'' = 30'

V: 1'' = 3'

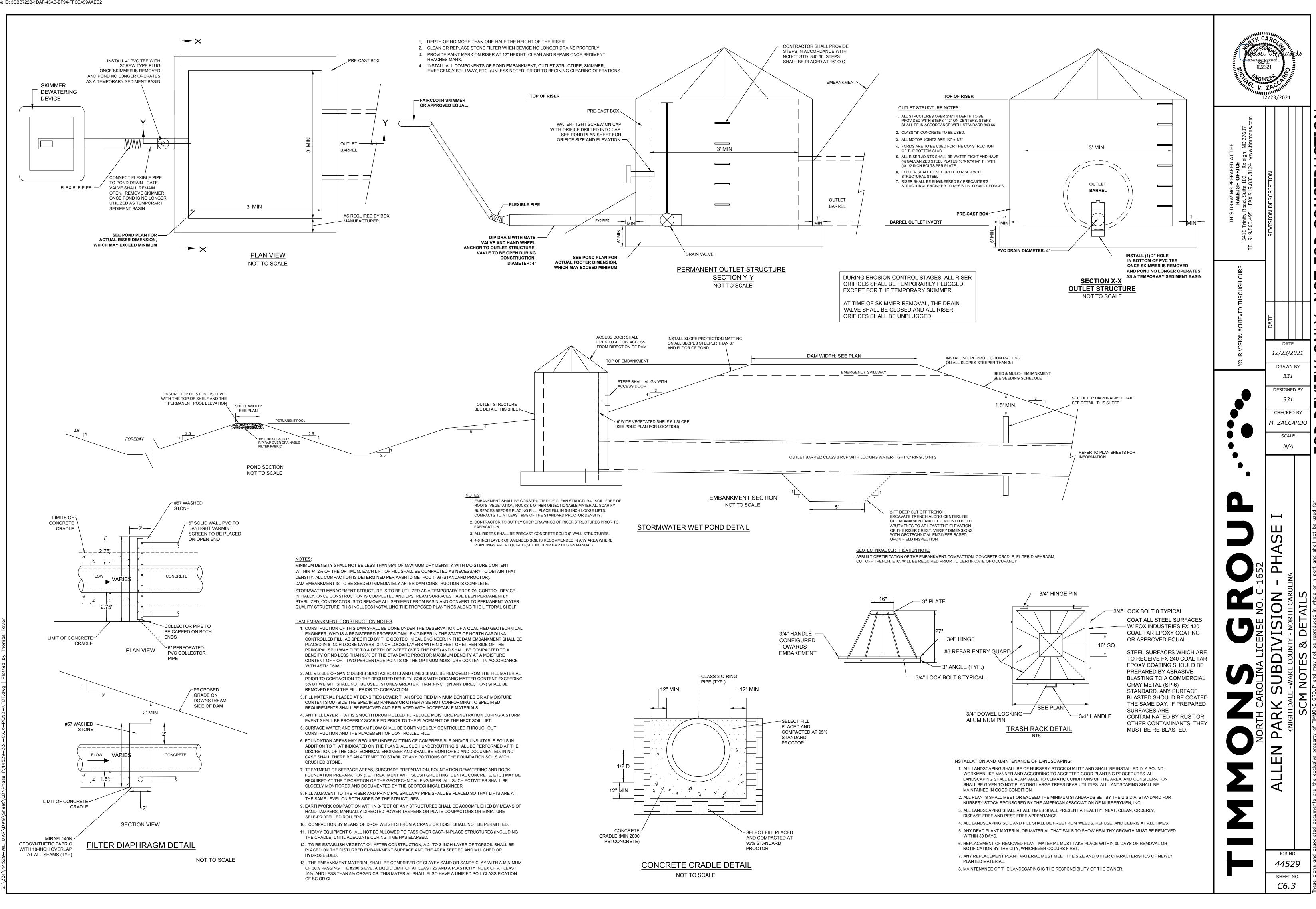
JOB NO. 44529 SHEET NO. C6.1

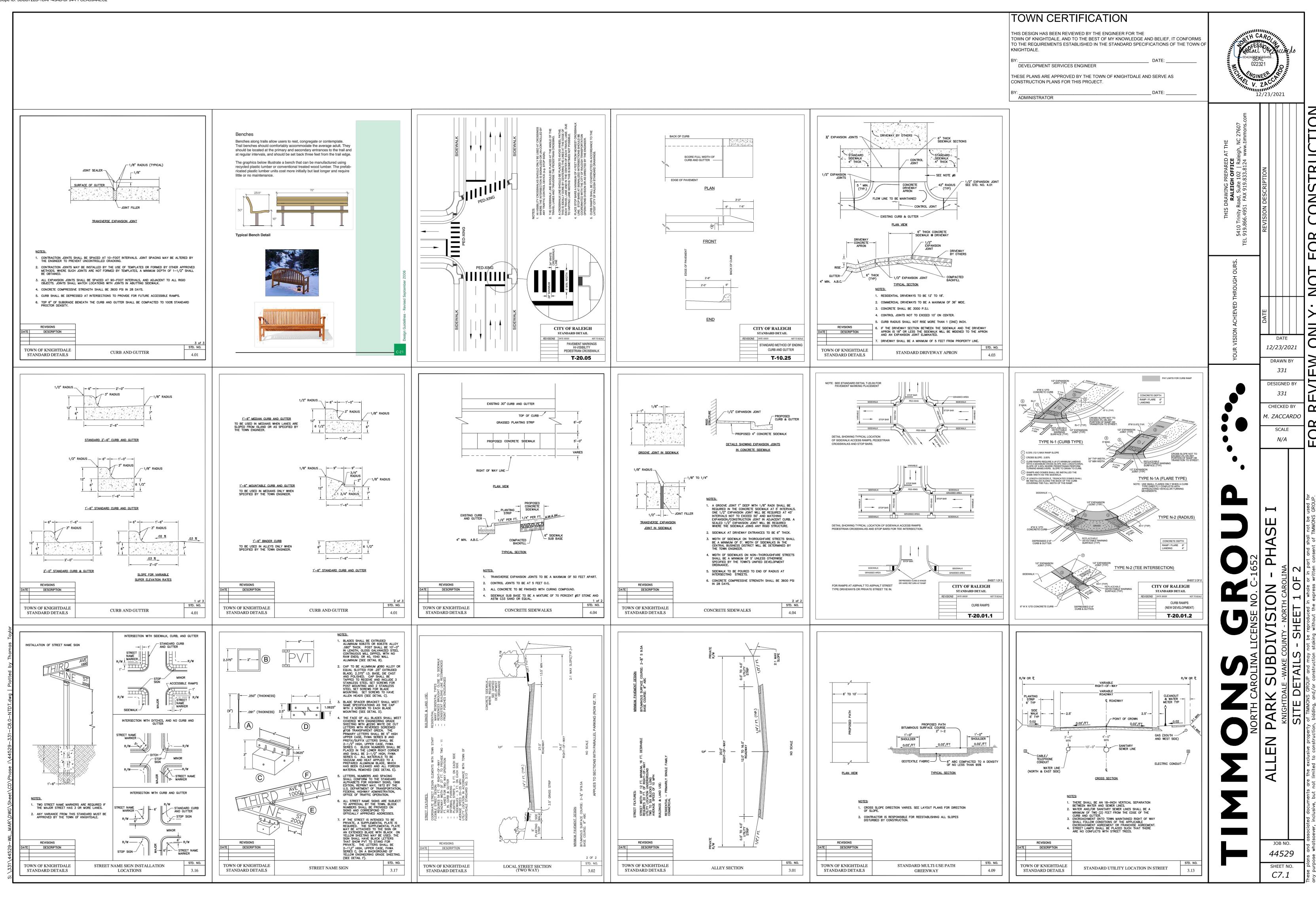


12/23/2021 DRAWN BY DESIGNED BY CHECKED BY . ZACCARDO

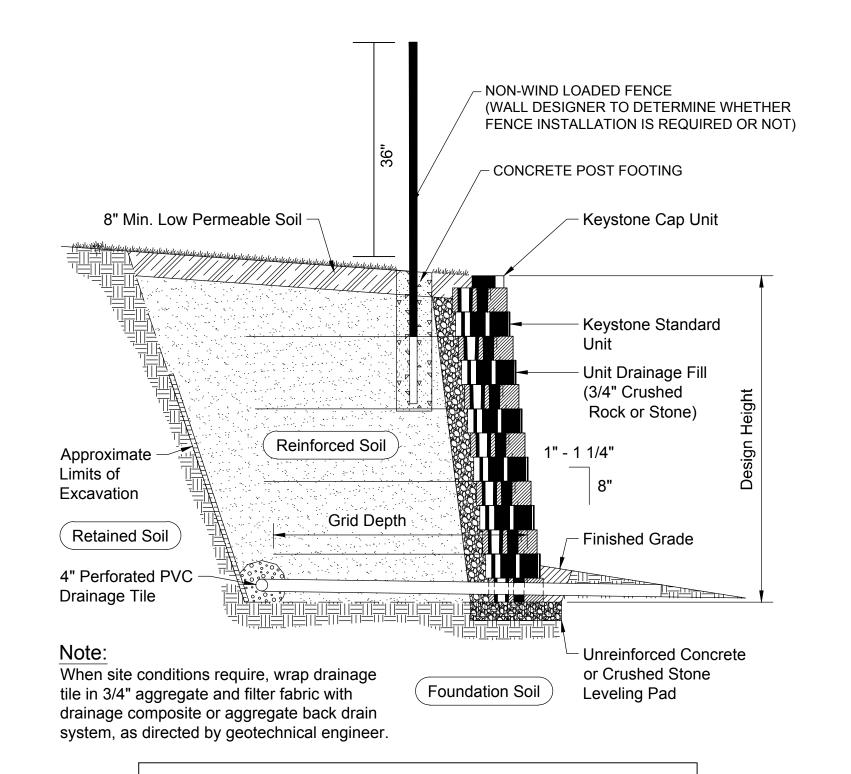
V: 1'' = 3'

SHEET NO.

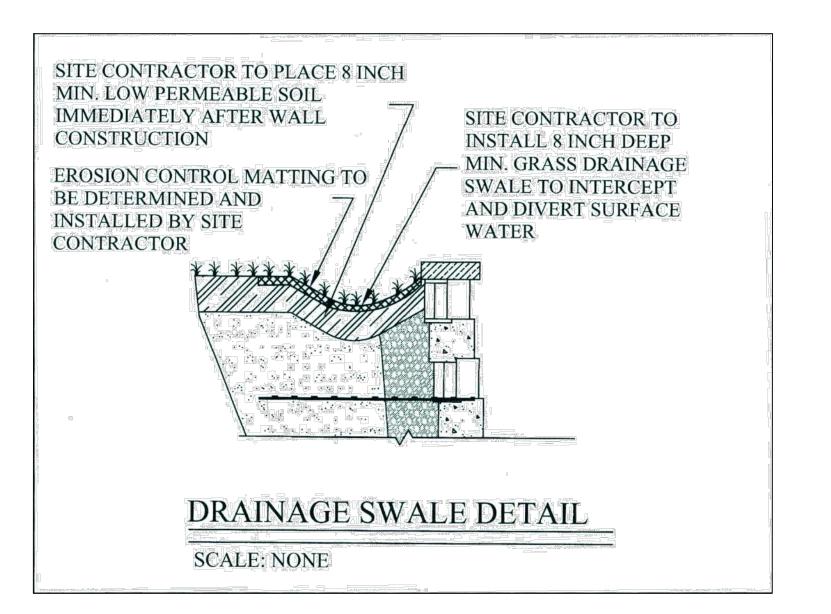


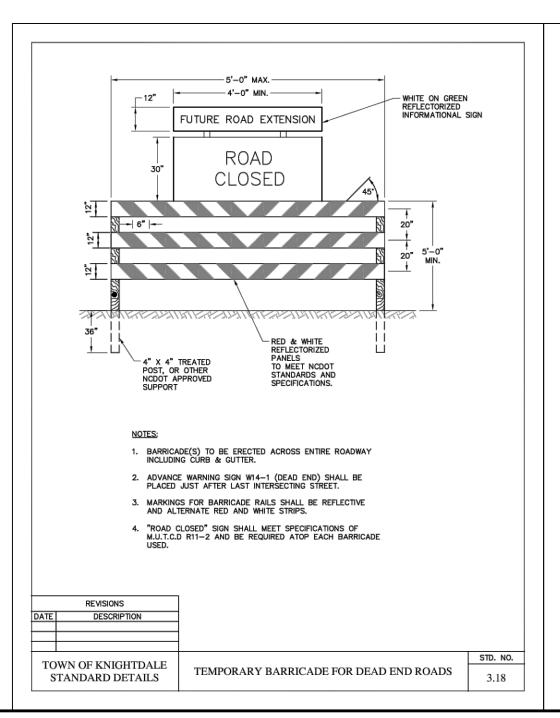


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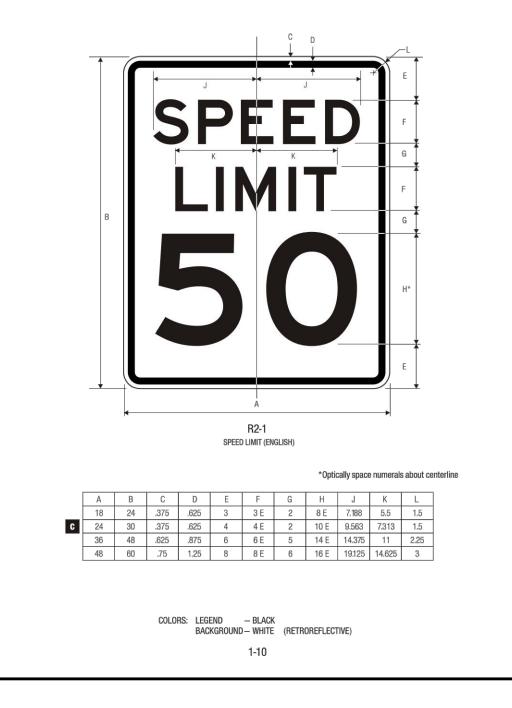


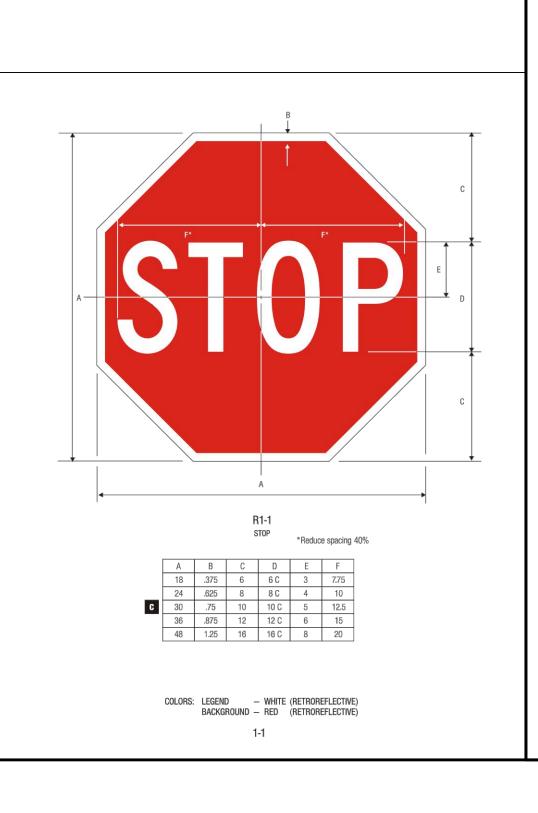
Typical Reinforced Wall Section (Designed By Others)











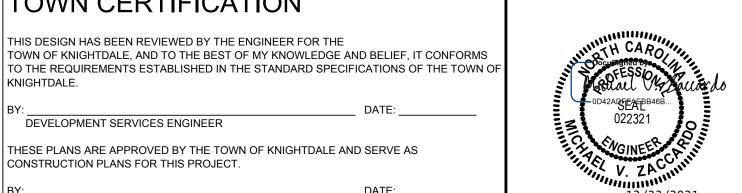
TOWN CERTIFICATION

DEVELOPMENT SERVICES ENGINEER

ADMINISTRATOR

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.



CONSTRUCTION

DATE 12/23/2021 DRAWN BY 331 DESIGNED BY

331 CHECKED BY ZACCARDO SCALE

N/A

AR Δ'

JOB NO. 44529

SHEET NO. *C7.2*

STANDARD UTILITY NOTES (AS APPLICABLE)

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION)

2. UTILITY SEPARATION REQUIREMENTS:

- A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL
- b) WHEN INSTALLING WATER &/OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER
- c) WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS
- d) 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER e) MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS;
- MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49)

SECTION C-C

COVER WEIGHT: 13 LBS +/- 5%

2. LIDS TO BE COATED WITH BITUMINOUS COAL TAR COATING

3. BOXES AND LIDS MUST BE MANUFACTURED FROM SAME

DEPARTMENT OF PUBLIC UTILITIES

WATER METER BOX DETAIL

445-401' OR APPROVED

PVC SADDLE

PIPE CROWN

EQUAL TO SEAL.

DOMESTIC FOUNDRY.

SECTION B-B

1.75" -

→ ¹³/₆" TYP.

SECTION A-A

- ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL
- ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION
- CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT

- 5. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS
- 6. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT
- PER CORPUD HANDBOOK PROCEDURE INSTALL 3/4" COPPER* WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE
- WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE INSTALL 4" PVC* SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM
- PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE
- 10. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE &/OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO
- 11. NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION
- GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION
- CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION

TOWN CERTIFICATION

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DATE:



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ADMINISTRATOR

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CURB AND GUTTER

PAVEMENT

CITY OF RALEIGH

DEPARTMENT OF PUBLIC UTILITIES

INSTALLATION DETAI

STANDARD FIRE HYDRANT

1'-3" | 1.9 LBS, EACH | X-24, Y-12

DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN DATA

FOR WATER MAINS

6" GATE VALVE

CONC. THRUST

BLOCK

City of Raleigh Public Utilities Department Permit #

TRAFFIC FLANGE BETWEEN

COMPACTED BACKFILL

(TAMPED IN 6" LIFTS)

6" MIN. BRANCH PIPE

\X\\\\X\\\\X

I. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M¢H,

RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE

FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE

REINFORCING REQUIREMENTS

I.D. PIPE REBAR SIZE "X" BAR LENGTH "X" BAR WEIGHT "Y" BAR LENGTH "Y" BAR WEIGHT NO. REQUIRED

#6 3'-0"+ O.D. PIPE 1.502 LBS/FT

SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.

REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER

4 TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION

SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3

. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.

. BACKFILL TAMPED IN 6" LIFTS PER

. THRUST COLLAR MUST BE FACTORY

WELDED ON BOTH SIDES ALONG BOTH

STANDARD DETAIL W-3.

CIRCUMFERENCE.

FDGES OF COLLAR AROUND

WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.

4. STEEL RODS AND BOLTS SHALL BE 3" HOT DIPPED GALVANIZED

5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION

2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C I 50-96

3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT

ANYTIME SITE WORK, CONSTRUCTION,

ROAD WORK, OR ANY OTHER WORK

FOR THE WORK IS RESPONSIBLE FOR

CHANGES THE GRADE OF THE FIRE

WITHIN COMPLIANCE.

3/4" HOT DIPPED

GALVANIZED BRIDLE ROD MAY BE COUPLED ONCE.

- 6" ABOVE GRADE



DATE 12/23/2021 DRAWN BY

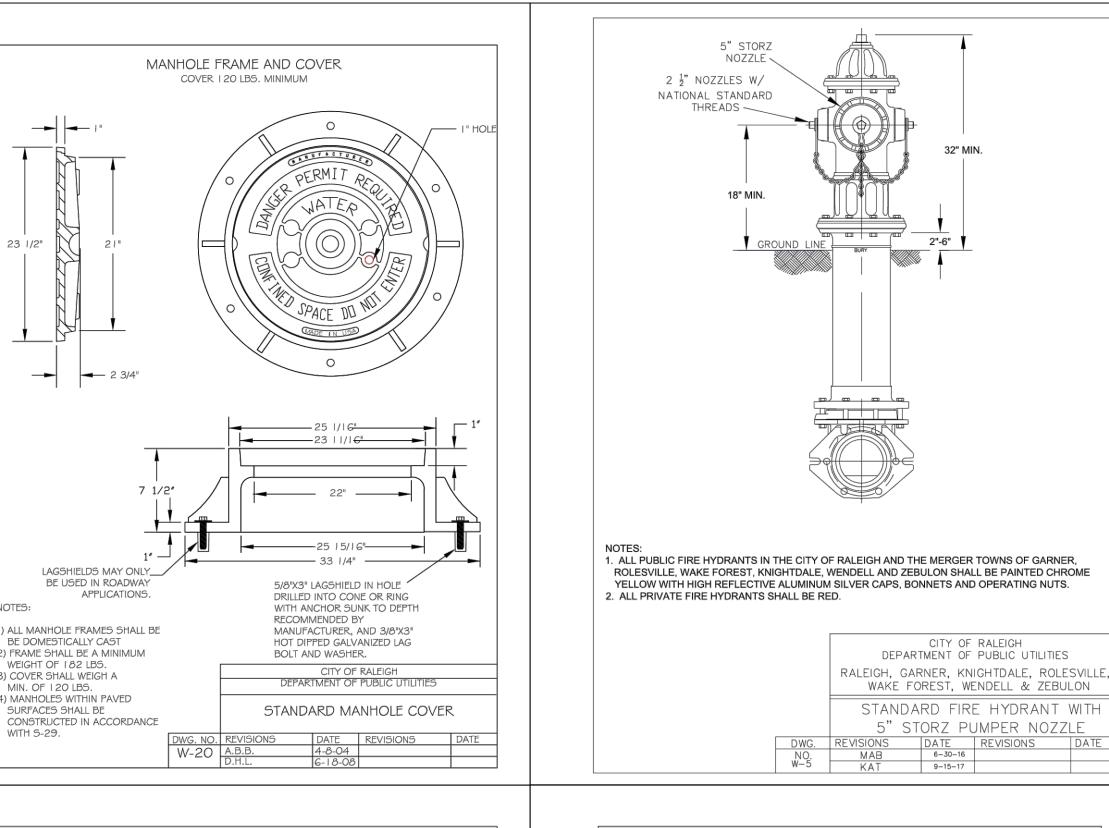
331 **DESIGNED BY** 331 CHECKED BY ZACCARD SCALE

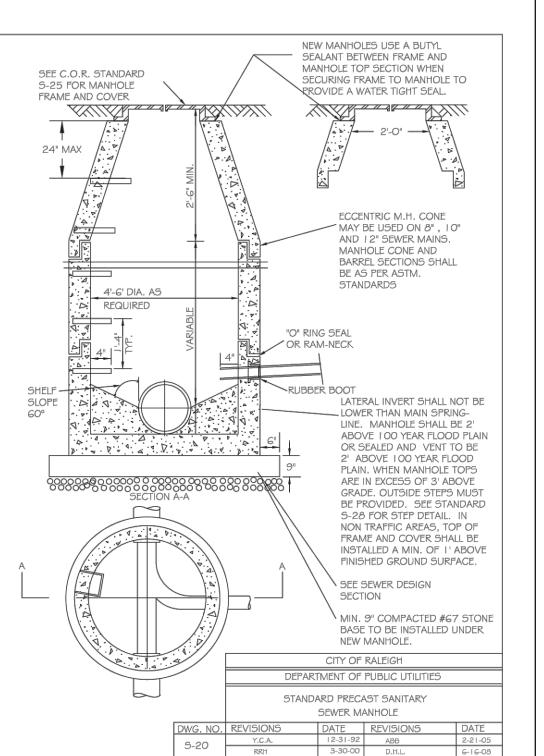
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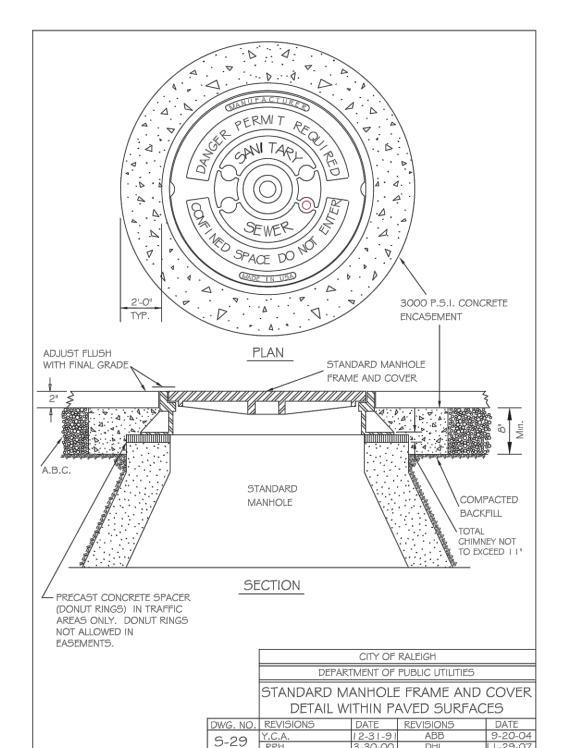
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JOB NO.

44529 SHEET NO. *C7.3*







MINIMUM 36" HORIZONTAL CLEARANCE

TOWARDS FIRE TRUCK ACCESS.

TRAFFIC FLANGE BETWEEN 2" - 6"

FIRE HYDRANT, PUMPER NOZZLE TO BE POINTED

COMPACTED BACKFILL

(TAMPED IN 6" LIFTS)

6" MIN. BRANCH PIPE

WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.

4 STEEL RODS AND BOLTS SHALL BE 3 HOT DIPPED GALVANIZED

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RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE

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HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE

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ANYTIME SITE WORK, CONSTRUCTION.

ROAD WORK, OR ANY OTHER WORK

CHANGES THE GRADE OF THE FIRE

WITHIN COMPLIANCE.

FOR THE WORK IS RESPONSIBLE FOR

ADJUSTING THE FIRE HYDRANT TO STAY

1'-3"x 1'-3"x 4" THICK

7 CU. FT. CRUSHED

NOTES

RESTRAINING GLANDS

CURB AND GUTTER

PAVEMENT

BLOCK

-UNDISTURBED EARTH.

RESTRAINING

CITY OF RALEIGH

DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT

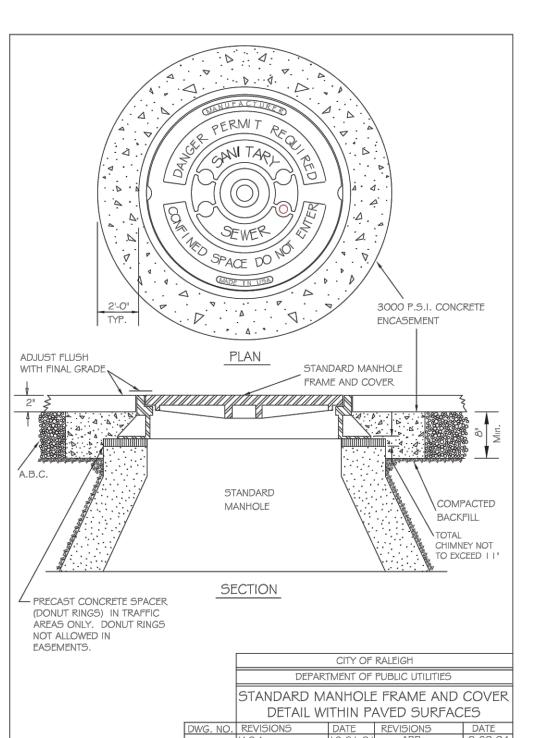
INSTALLATION DETAIL

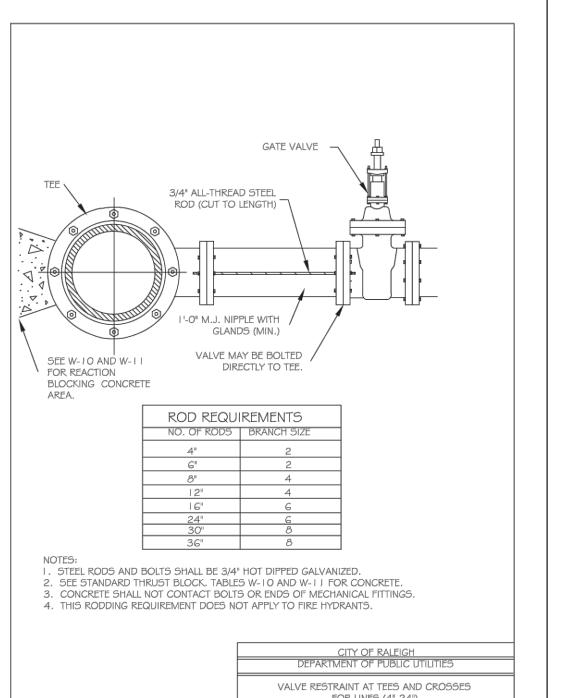
6" GATE VALVE

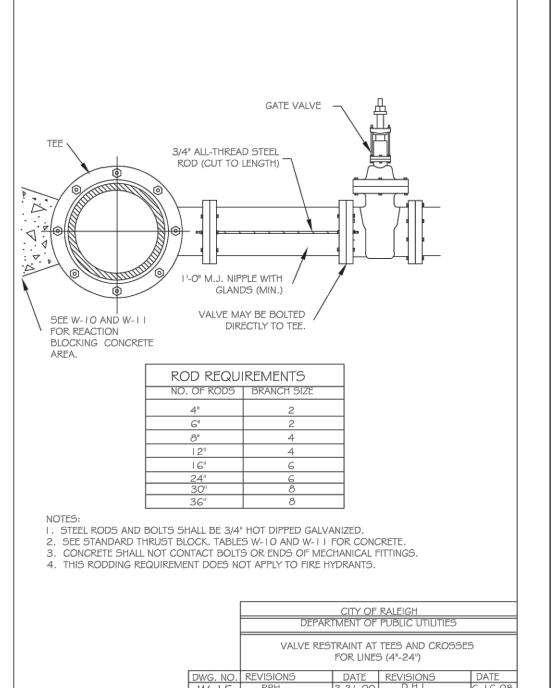
CONC. THRUST

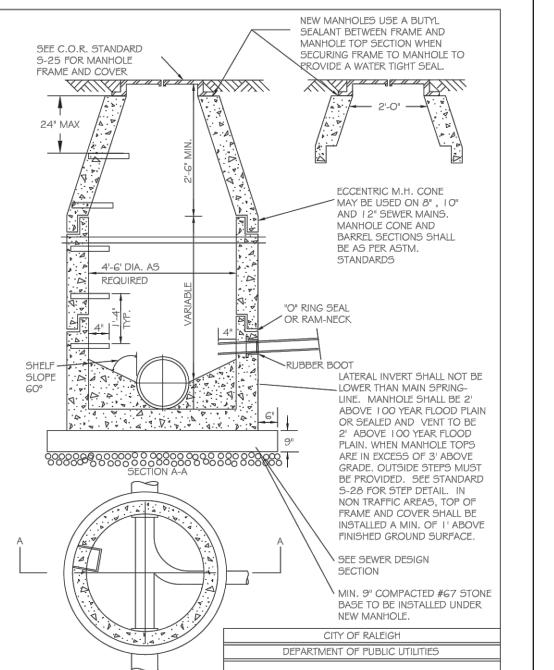
FROM ANY OBJECT.

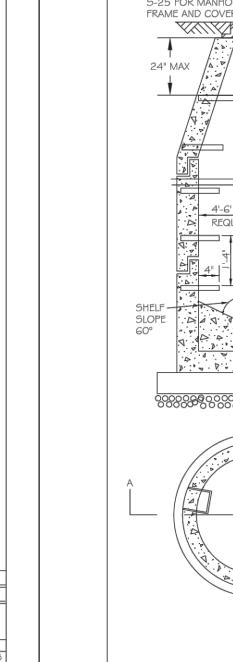
ABOVE GRADE

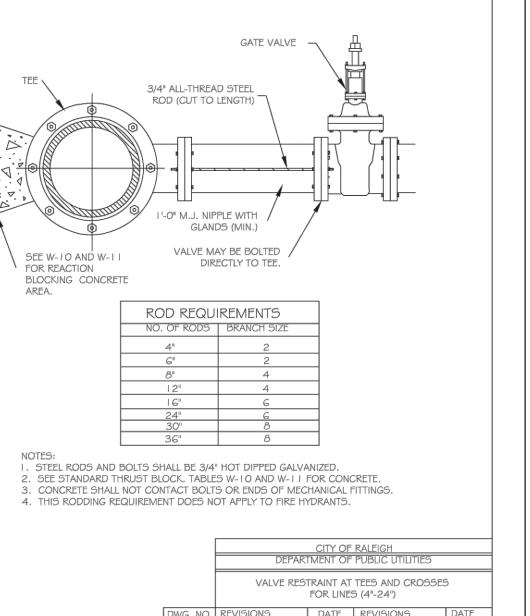


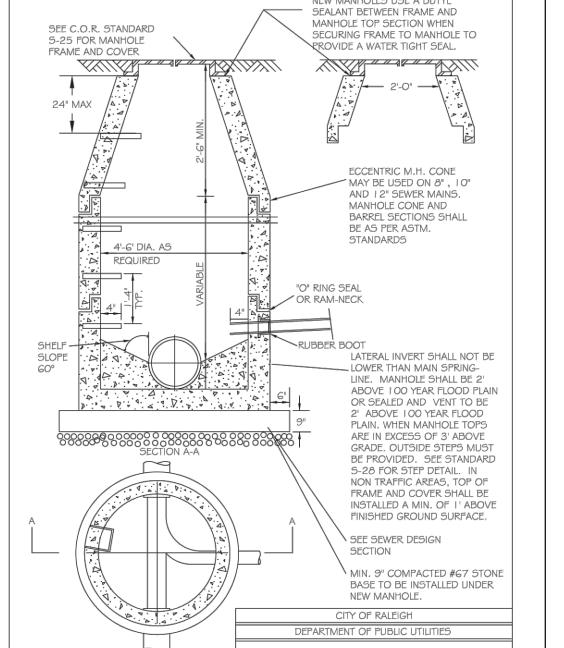


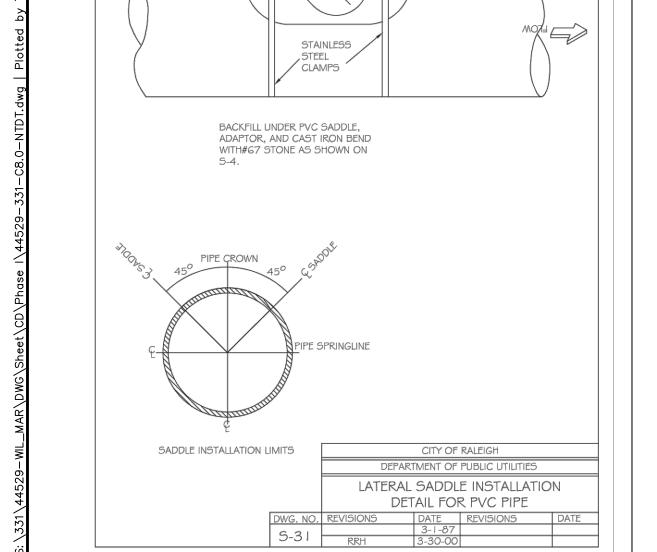


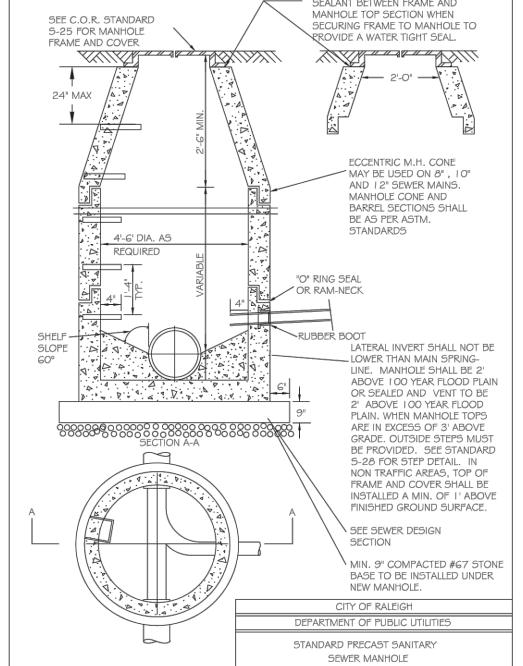












TOWN CERTIFICATION

THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF

DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

ADMINISTRATOR

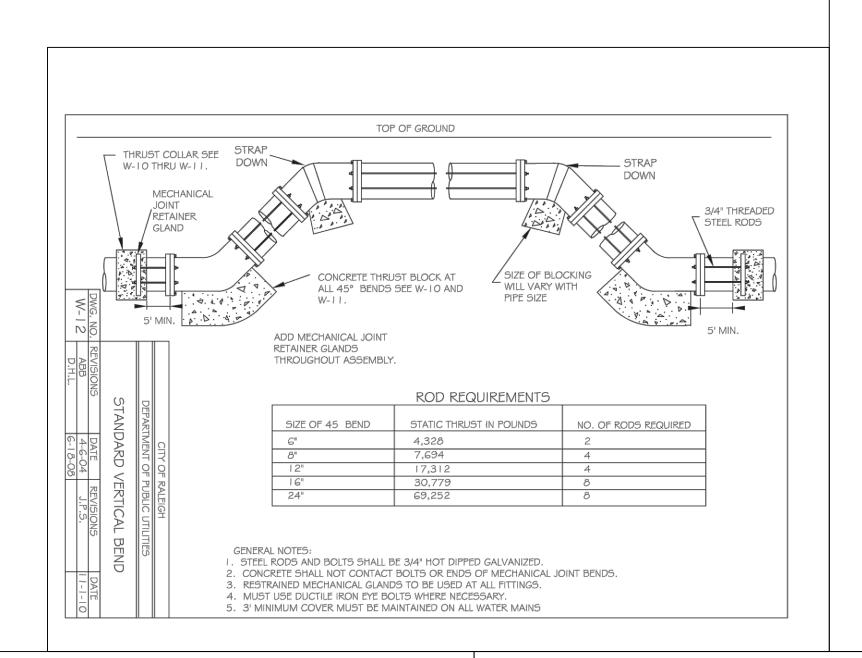
Water and Sewer Permits (If applicable)

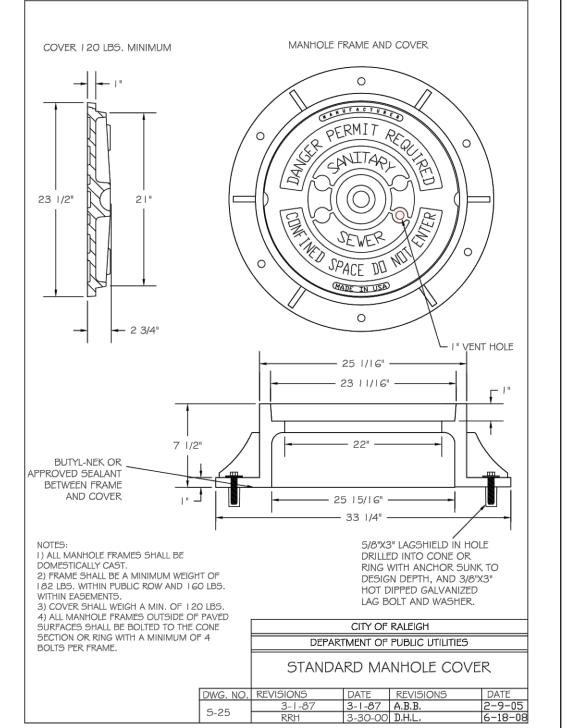
The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # XXXX

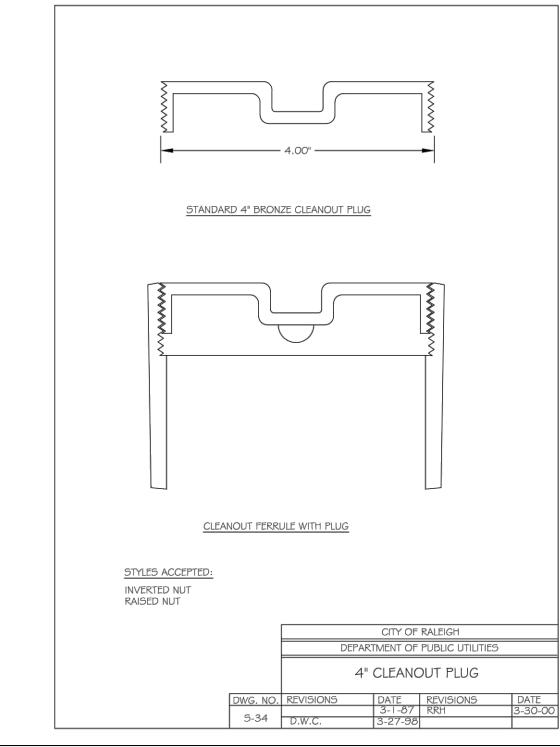
The City of Raleigh consents to the connection and extension of the City's **Public** Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # XXXX

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and constructions methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit #







MIN. 2 X DIAMETER-

2-FLANGE X FLANGE -ELBOWS BOLT TOGETHER

FLANGE X FLANGE >

FLANGE X FLANGE >

WITH TWO BOLTS.

CONCRETE PAD AROUND

BLOW OFF VALVE

SEE DETAILS W-8 #

BLOCK INFORMATION

W-9 FOR THRUST

VALVE AT FINISHED GRADE

4" DIA, WATER MAIN MARKER

> BLIND FLANGE WITH TWO BOLTS

> > (SEE NOTE #1)

-CONCRETE

DETAIL W-20 TO BE

MANHOLE COVER

FLANGE PIPE:

PLAIN END

3000 PSI CONCRETE

WITH 4" THICKNESS

I. DRILL 1/4" WEEP HOLE FOR STACK DRAINAGE INTO STONE.

3. A RIP-RAP SWALE FROM FROM CONCRETE SPLASH PAD TO

4. BOTTOM 90 ELBOW SHALL HAVE BLIND FLANGE ATTACHED

5. INSTALL WATER MAIN MARKER AT R/W OR P/L TO LOCATE

6. 3/4" RODS AND BOLTS TO BE HOT DIPPED GALVANIZED.

7. END PIPE SIZE 6" MIN. OR AS APPROVED BY PUBLIC

2. DOUBLE 3/4" BRIDLE RODS ON BOTH SIDES.

POSITIVE DRAINAGE AREA IS REQUIRED.

6"X8'X8" CONCRETE

PAD DIRECTED TO NATURAL DRAINAGE AREA (SEE NOTE #3)



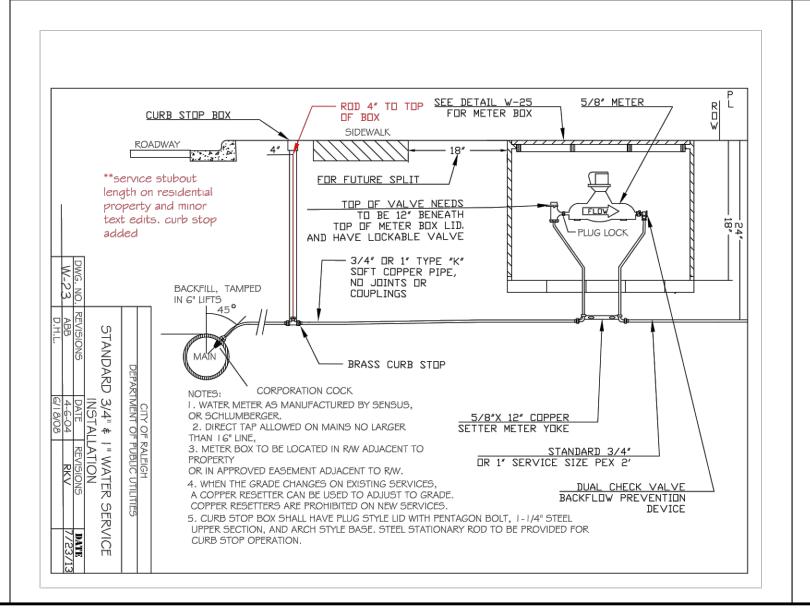
DATE 12/23/2021 DRAWN BY 331

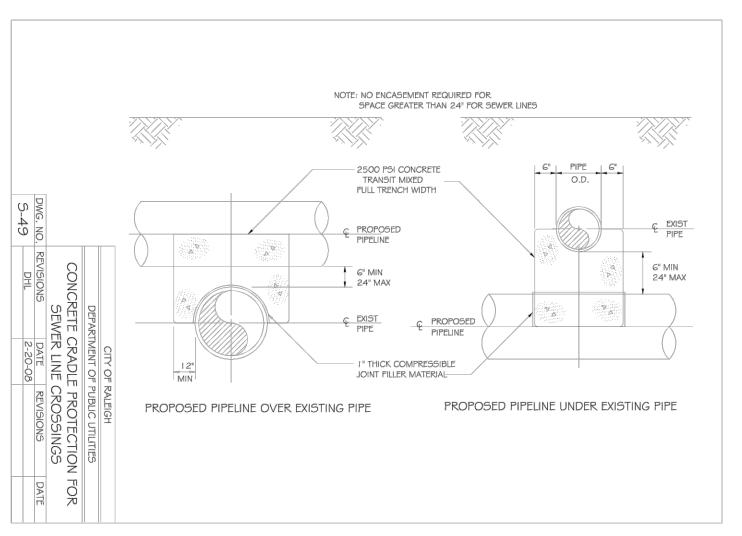
DESIGNED BY 331 CHECKED BY

. ZACCARDO SCALE N/A

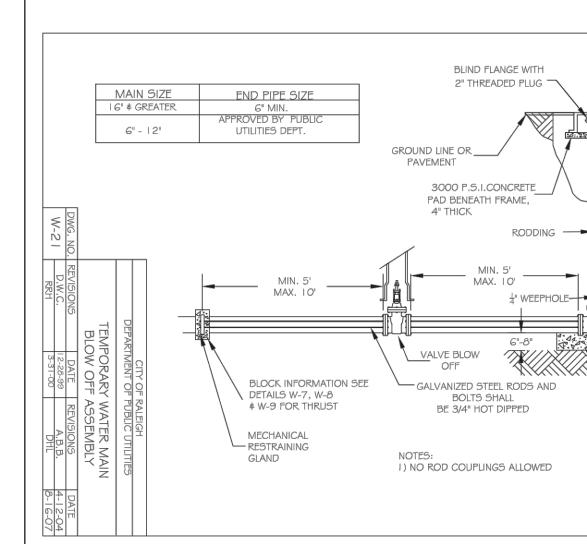
JOB NO. 44529 SHEET NO. C7.4

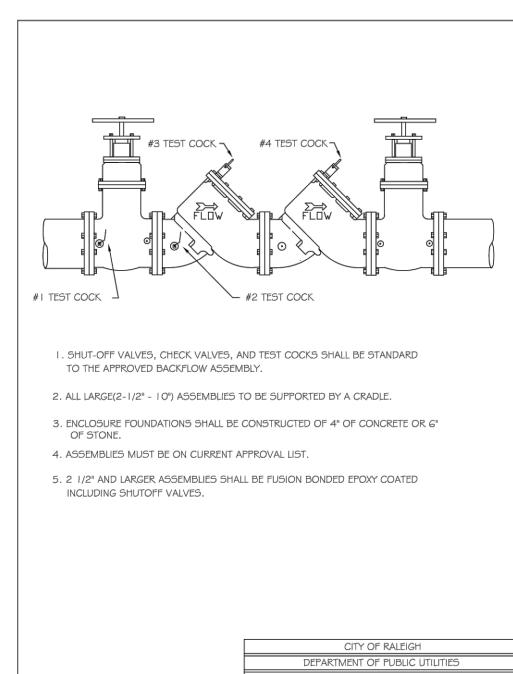
STANDARD METER BOX NOTE: NO ENCASEMENT REQUIRED FOR SPACE GREATER THAN 18" FOR WATER LINES TOP OF VALVE NEEDS TO BE 12" BENEATH TOP OF METER BOX LID. - Flowable fill full Trench width I'SERVICE SIZE SET BOX ON THREADED BRASS CONCRETE BLOCKS THE BACKFLOW PREVENTER LOCATION IS DEPENDENT ON THE TYPE DEVICE PROPOSED FOR USE AS FOLLOWS: PROPOSED PIPELINE OVER EXISTING PIPE ONE OR TWO FAMILY RESIDENTIAL COMMERCIAL LOCATION BACKFLOW PREVENTION FORD ANGLE CHECK SHALL BE DETERMINED OR OTHER APPROVED BY OCCUPANCY # DUAL CHECK VALVES APPROVED BACKFLOW



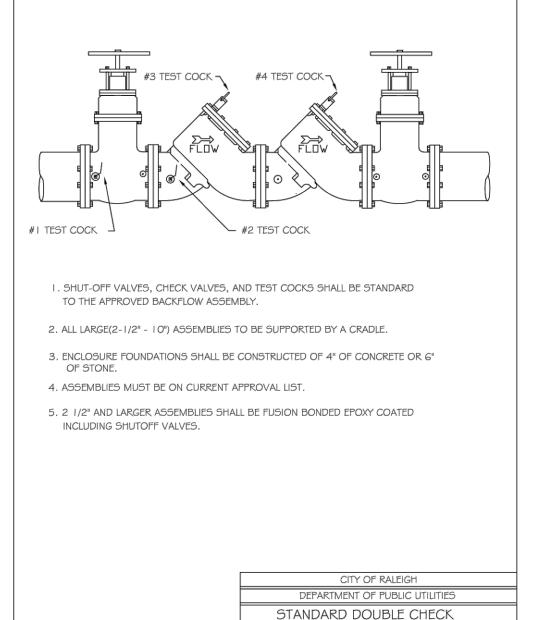


PROPOSED PIPELINE UNDER EXISTING PIPE

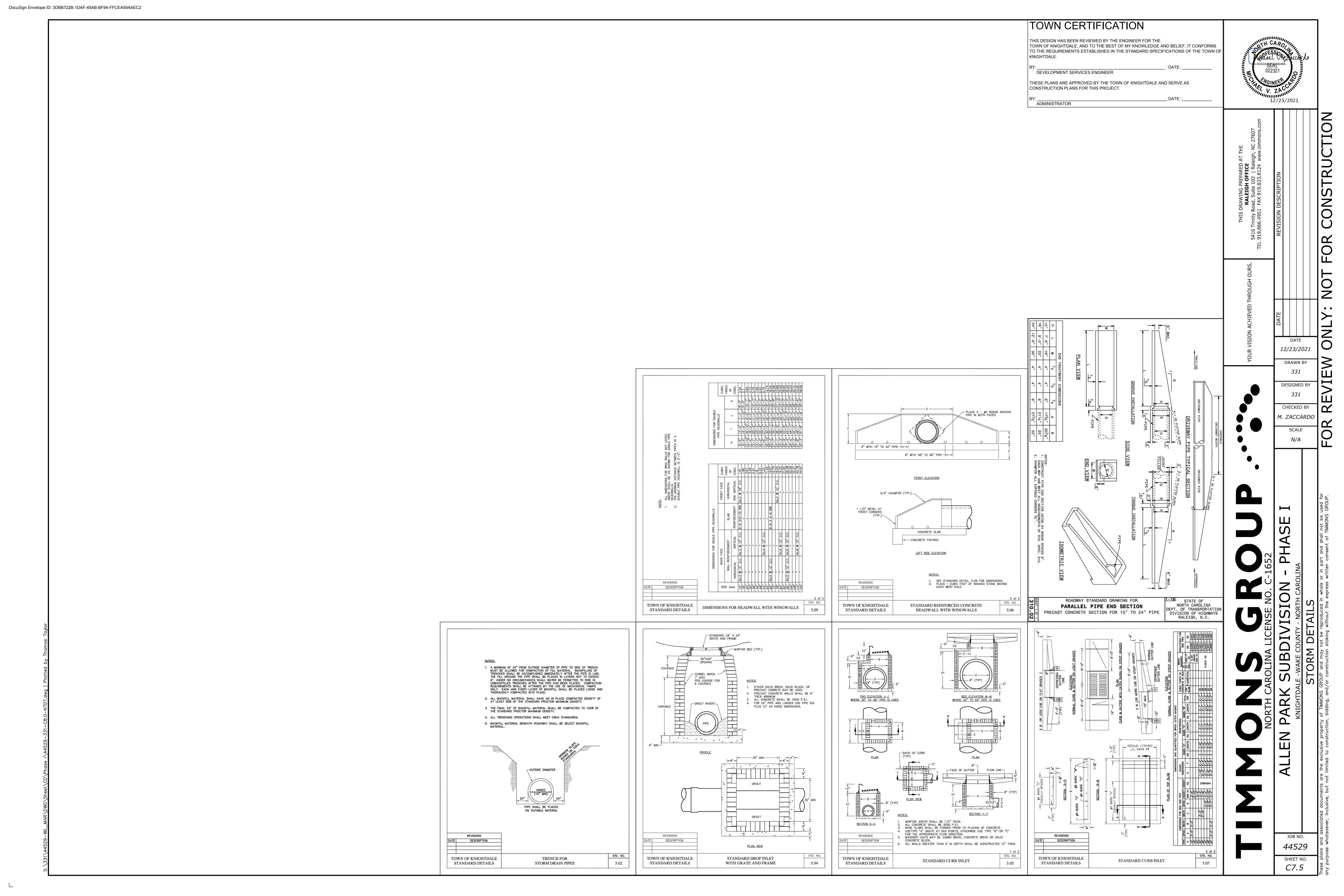


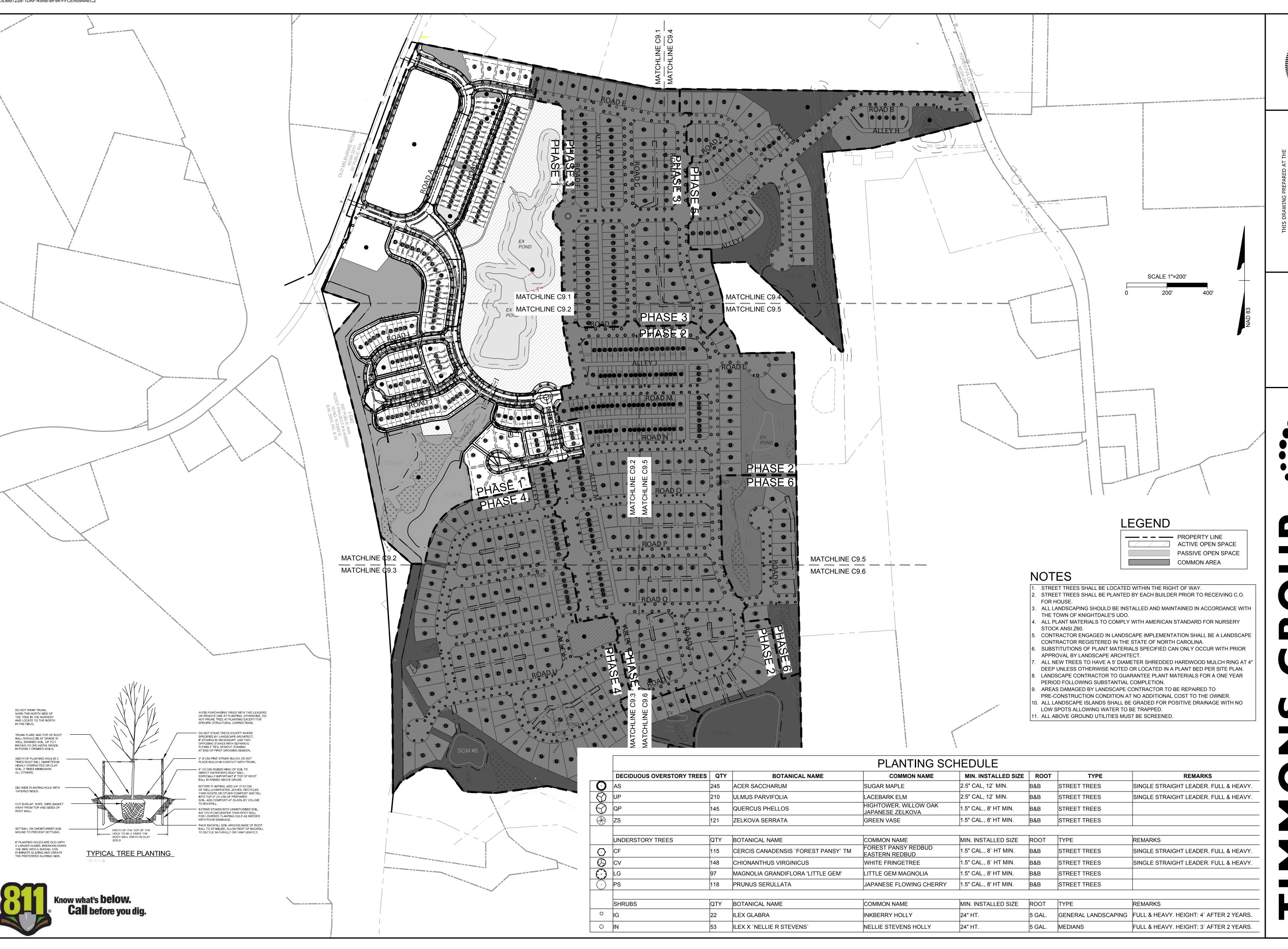


W-38 RRH



VALVE ASSEMBLY





12/23/2021

1"=200'

AR

JOB NO. 44529 SHEET NO.

C9.0



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